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# Rock Products

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\$2.00 A YEAR

CHICAGO

JULY 5, 1919

225

## BROOMELL

### *Improved Lime Kiln*



The BROOMELL Lime Kiln embodies in its design every improvement that a long experience in building kilns could suggest. It can be erected with unskilled labor at minimum cost. All joints of plates are covered with butt straps adding greatly to strength. No riveting. Furnaces are of improved design giving long life to the brick lining. Hearth plates for the furnaces are carried on cross beams which rest on 12 in. beams extending in one piece through the piers. These beams can be extended to carry the floor. Cooling Cones are provided with a heavy Cast Iron sub-

cone at bottom. The sub-cone rests on heavy I Beams thus taking all weight off of the cone sole plate. Discharging gates are of improved pattern and run on anti-friction rollers. Send for Booklet.

**A. P. Broomell, Manufacturer, York, Pa., U. S. A.**

USDA  
LIB



USE  
**JAITE**  
PUNCTURE  
AND  
WATERPROOF  
BAGS

FOR SAFE  
DELIVERIES

## ATTENTION

Cement Manufacturers  
and Supply Dealers

Cement packed in Jaite Water-  
proof Bags not only excludes the  
moisture, but also refuses to take  
on cement dust and dirt. Package  
always keeps fresh and clean.

**THE JAITE CO.**  
JAITE, OHIO  
Sole Manufacturers

## "PENNSYLVANIA"

### Hammer Crushers




For Crushing and Pulverizing Lime,  
Limestone, Gypsum, Marl, Shale, Etc.  
Main Frame of Steel, "Ball and Socket"  
Self Aligning Bearings; forged Steel  
Shaft; Steel Wear Liners; Cage ad-  
justable by hand wheel while Crusher  
is running. No other hammer Crusher  
has such a big Safety Factor.

PATENTED

**Pennsylvania Crusher Company**

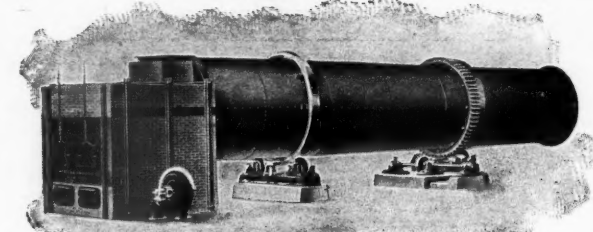
New York
PHILADELPHIA
Pittsburgh

## EXCAVATE with OWEN BUCKETS



Ask  
for  
Pamphlet

**The Owen Bucket Co.**  
38 Rockefeller Bldg.  
Cleveland, Ohio



## DRYERS

**AMERICAN PROCESS CO.** 68 Williams Street  
NEW YORK CITY



This Wall  
will grow big crops  
for the farmer and  
profits for you



*The First Step Is Blasting—  
Do That With Safe, Reliable*

## Cordeau-Bickford Detonating Fuse

*Greater Blasting Power*

**The Ensign-Bickford Co.,** Simsbury, Conn.  
Established 1836

Original Makers of Safety Fuse

July 5, 1919

# 272656 Rock Products

1

ROCK PRODUCTS is published every other week by Tradepress Publishing Corporation, 542 So. Dearborn St., Chicago. Subscription: \$2.00 a year in the United States, \$3.00 in Canada. Entered as second class matter July 2, 1907, at the postoffice in Chicago, under Act of March 3, 1879.

VOL. XXII—No. 14  
July 5, 1919



272656 JUN 30 1919

Rock Products seeks and reports everything of interest to producers of crushed stone, sand, gravel, lime, cement, gypsum products, agricultural limestone, phosphate, potash and glass sand. It spends many times more money than any other journal of the industry to compile its message every two weeks. Appreciate Rock Products.

## Rock Products

# 26 Big Issues for \$2

Stands without a peer in the industry. It serves the plant owners without stint or bias. Its reading pages are loaded with pictures and news.

Its advertisements are on advertising pages—where in fairness to all—they belong.

Read Rock Products—not because it serves you unselfishly but because it is the best paper. Subscribe!

### Fill Out and Mail the Coupon—Now!

ROCK PRODUCTS, 542 So. Dearborn St., Chicago

Here is my \$2.00 for a full year's subscription to ROCK PRODUCTS.

Name.....

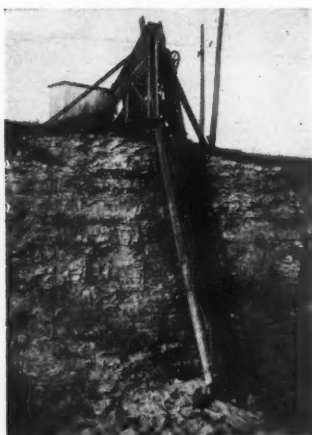
Address.....

Saying, "I saw it in ROCK PRODUCTS," will bring quick action



# Webster

For Elevating and Convey-  
ing in Quarries—



Webster Bucket Elevator from  
Quarry to Cars

# Machinery

in Sand and Gravel Plants  
and Wherever There Are  
Large Operations

## Quickly Pays Handsome Profits

Webster Machinery will help  
get out more product and will cut  
the per ton costs of handling.

And because it is staunchly  
built, and designed intelligently  
for the work to be performed, it  
gives the user a maximum benefit

at a minimum maintenance cost.

Since we build nearly every  
type of Conveying, Elevating  
and Power Transmission Ma-  
chinery, we can supply the kind  
best suited to each specific need.

Catalog and Engineering Recommendations upon Request

**THE WEBSTER M'F'G COMPANY, Tiffin, Ohio**

New York, 90 West St.

Boston, 141 Milk St.

Chicago, McCormick Bldg.



Webster Digging and Screening Plant on Dredge Boat

*Cooperation is the thing—please mention ROCK PRODUCTS*



# Does Your Limestone Go Into **KEYSTONE KILNS?**



*Sustained  
Tonnage  
Uniform  
Product*

Open the door to bigger profits through a more satisfactory product with Keystone Kilns.

Wide usage is not the only indication of Keystone merit. A more striking evidence is the fact that more Keystone Kilns are sold on repeat orders than any other. This also speaks for the prosperity of Keystone Kiln operators.

It's all in knowing what's needed that gives Keystone the "edge." Keystone engineers not only have had years of experience in designing but also in the actual production of lime.

Write. Tell us your troubles. We'll furnish the solution.

*Watch the Figures Grow*

**237 Kilns**  
in use to date

## **STEACY-SCHMIDT MFG. CO., York, Pa.**

*For better service say, "I saw it in ROCK PRODUCTS"*

**AETNA DYNAMITE**

**"LION" ELECTRIC BLASTING CAPS**

**"LION" BATTERY**

**PROPER LOADING**

*An Aetna Combination that will look any blasting problem*

**A**ETNA DYNAMITE—of a particular grade that will suit your individual requirements—should be the first point to turn to on your dial of blasting problems, because it is so made as to represent, figuratively, when properly loaded, the right "tumbler" in your locked-up strata. And, Aetna Dynamites differ essentially from most brands in that they produce less fumes.

Turning to "Lion" Electric Blasting Caps, they contain a Fulminate of Mercury charge, which makes them the most dependable and efficient detonator known. We direct your attention to the .30 calibre diameter of "Lion" Electric Blasting Caps. The advantage of this diameter shell is that it gives the maximum concentration of charge, which is of vital importance. If a smaller diameter shell is used the same sized charge would be proportionately longer, and instead of a powerful blow being delivered upon a small area—such as our .30 calibre shell gives—there would be a diminished one over an extended area, with the possibility of imperfect detonation.

Then turning to Proper Loading, we find a point that is often out of true in general practice. We will mention here only one instance: We have known of blasters who have put an Electric Blasting Cap with a four-foot lead in a

hole twenty feet deep and then attached light connecting wire to it because it is cheaper than the longer wires of a twenty-foot Electric Blasting Cap which are made to withstand a greater pressure. No matter how carefully a joint is made, there is more resistance to the firing current in a joint than there is in solid wire. This idea—and we have seen it used many times—is a mighty expensive attempt at economy. Proper loading, from the first stick of dynamite to the top of the tamping, and the making of proper connections, is all important.

Finishing up the combination with a "Lion" Blasting Machine, we have in it a powerful dynamo, simply constructed, yet in such a way, and of such materials, that it withstands hard usage and comes as near taking care of itself as any machine can.

## AETNA EXPLOSIVES COMPANY, Inc.

NEW YORK CITY

Birmingham, Ala.  
Buffalo, N. Y.  
Chicago, Ill.  
Denver, Colo.

Duluth, Minn.  
Joplin, Mo.  
Louisville, Ky.

### BRANCH OFFICES:

New Orleans, La.  
Norristown, Pa.  
Pittsburgh, Pa.

Pottsville, Pa.  
Roanoke, Va.  
St. Louis, Mo.  
Wilkes Barre, Pa.

# WEBB CITY and CARTERVILLE CRUSHERS

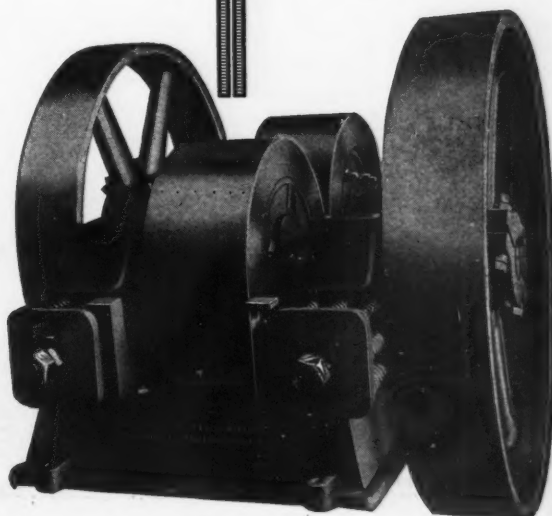
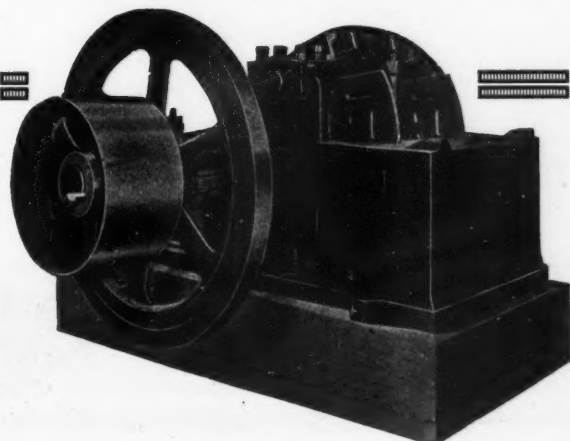
IT is in ledgers that you will find good and sufficient reasons for using Webb City and Carterville Crushers. We can show you actual instances where the installation of our crushers has increased production while decreasing running expenses.

Few repair expenses, is one of the characteristic advantages of Webb City and Carterville Crushers. A typical reason for their ruggedness is their superlative simplicity. Have fewer parts than any other crushers—hence easier to keep in running order.

Webb City and Carterville Standard Crushers and Crushing Rolls are designed to meet the most advanced and modern practice in wet and dry ore crushing; to have all the practical points of merit that long continued use has shown to be of value.

*Don't you think it advisable to write for literature that gives complete details?*

**Webb City & Carterville  
Foundry & Machine Works  
Webb City, Mo.**



*You will get entire satisfaction if you mention ROCK PRODUCTS*





PLANT AT  
SPRINGFIELD  
OHIO WHERE



"ARNOLD"  
KILNS ARE  
INSTALLED.

## Burning Testimony

Our installations are our basis for the solicitation of further business. We make no claims that we cannot prove by examples in actual operation.

When we say that "ARNOLD" Kilns use less fuel than others; that they double capacity; that we build them quickly and at moderate cost, we point to our installations to substantiate our statements.

Fact is, many of the most profitable lime plants have "ARNOLD" Kilns. These operators have given us glowing accounts of our work.

Our Service Department is expert in designing, building and repairing kilns in part or in their entirety. Ask for facts.

**VALENTINE ARNOLD**

*Contractor and Builder*

**Woodville, Ohio, U. S. A.**

*Prompt attention will be given your inquiry if you mention ROCK PRODUCTS*

*Another*

# FEDERAL

## Federal Built for Heavy Work

Contractors who have seen various makes of motor trucks at work on heavy excavation or construction jobs have written us in many instances ordering Federals, so impressed have they been with Federal performance.

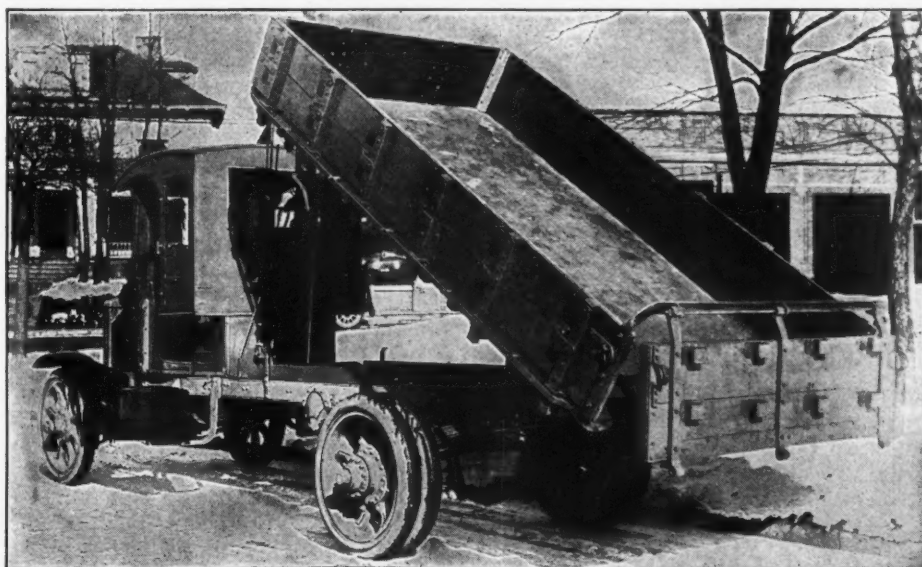
When the Federal works alongside the others and stands out as superior in its performance, there is little doubt left in the mind of the discerning man as to the truck he should buy.

Heavy loads and constant work do not wear down the stamina of the Federal, for it was built for just that kind of service.

Write for "Traffic News," an interesting magazine of truck haulage, which will be mailed without charge.

*"Shorten the miles to market — build better roads"*

FEDERAL MOTOR TRUCK COMPANY  
43 FEDERAL STREET DETROIT, MICH.



*This Federal, as equipped, may be used as a dump-truck, as a flat platform truck, or as a stake truck. This combination body makes available many added uses.*

*To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry*



# LOCOMOTIVE CRANES

CLAM SHELL BUCKETS - SHIPBUILDING CRANES  
CAR DUMPERS PILE DRIVERS

## THE McMYLER INTERSTATE Co.

CLEVELAND OHIO





A McMyler Interstate Type "B" Locomotive Crane operating in a sand or gravel pit will handle a maximum amount of material at a minimum cost. That is why this crane represents a profitable investment for sand and gravel dealers. It is not only built for speed, but endurance as well.

To learn more about this excellent machine, inquire of

**CRANE HEADQUARTERS**

**The McMyler Interstate Co.**  
**CLEVELAND, OHIO**

**BRANCH OFFICES:**

New York  
1756 Hudson Terminal Building

San Francisco  
Merchants Exchange Building

Seattle  
Hoge Building

Chicago  
812 Edison Building

*It gets immediate attention if you mention ROCK PRODUCTS*



# AMERICAN RING PULVERIZER

**SAVE** your waste!  
Lime Manufacturers:  
Create a by-product revenue producer — Agricultural Limestone.

No doubt you have piles of fine limestone, rotting in the mud and rain around your plant. Convert this into agricultural limestone and get real money for it.

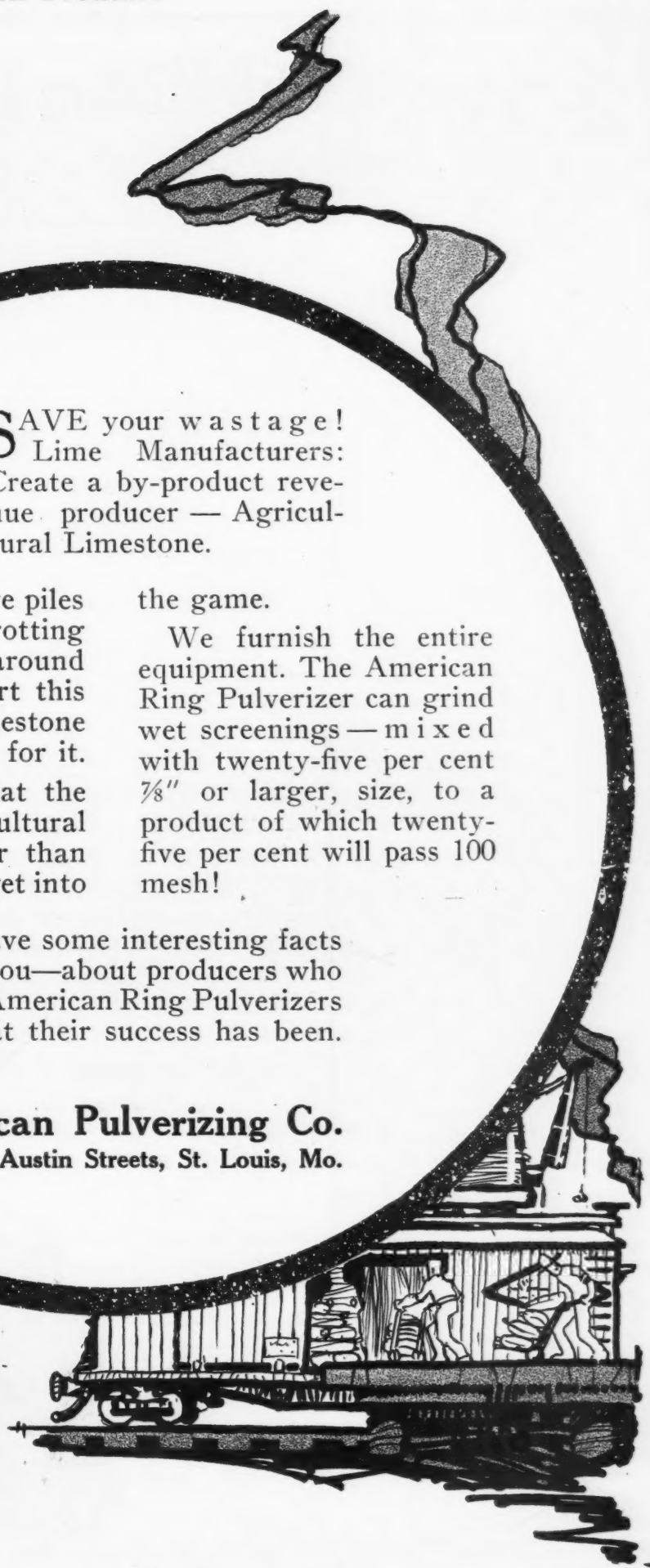
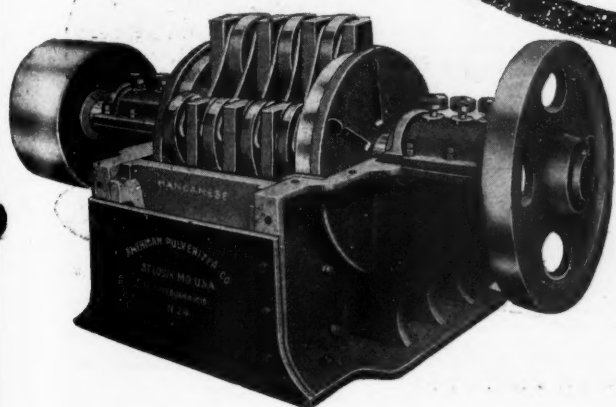
Do you know that the demand for agricultural limestone is greater than the supply? Then get into

the game.

We furnish the entire equipment. The American Ring Pulverizer can grind wet screenings — mixed with twenty-five per cent  $\frac{7}{8}$ " or larger, size, to a product of which twenty-five per cent will pass 100 mesh!

We have some interesting facts to give you—about producers who bought American Ring Pulverizers and what their success has been. Facts!

**American Pulverizing Co.**  
18th and Austin Streets, St. Louis, Mo.



# 50 Million Tons of Limestone

*Are Needed in Illinois Alone*

says Prof. Readhimer—  
a state agricultural expert

## Traylor Ball Mills

*Will Do the Job Well*

—They are the simplest and most efficient pulverizers made.

—They run at slow speed.

—They're dustless.

—They require no screens.

—They will pulverize crusher rejections as readily as they will screenings.

—They're made with capacities of two tons per hour up.

Write us today for worth-while data on Ball Mill operation. —

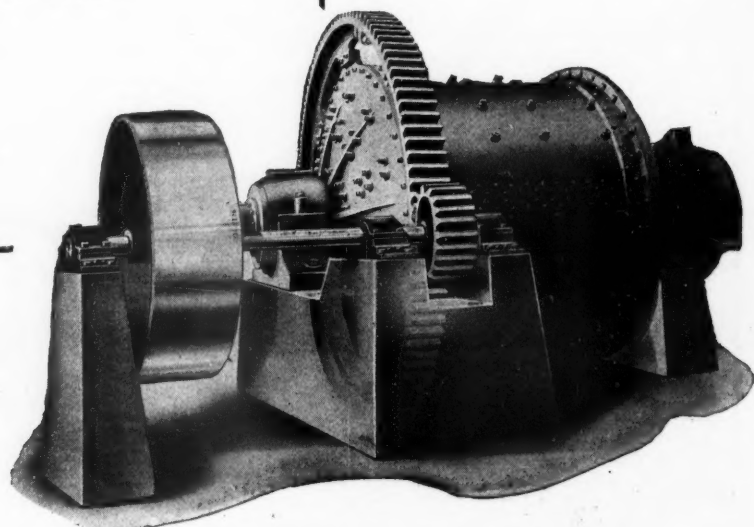
**Traylor Engineering & Mfg. Co.**  
Allentown, Pa.

CHICAGO  
1414 Fisher Bldg.

NEW YORK  
30 Church St.

LOS ANGELES  
Citizens Bank Bldg.

SPOKANE  
Mohawk Bldg.



*Cooperation is the thing—please mention ROCK PRODUCTS*



## A Tough Conveying Job

*But the Leviathan Belt is making a record  
for low cost per ton*

**T**HIS Leviathan belt, installed in 1916, has been handling 700 tons of slag during ten hours every working day since, from railroad hoppers to crusher. It will give lots more fine service.

*Size belt:* 306' x 30" x 8 ply  
*Angle of Incline:* 20  
*Rollers used:* 30" troughing made by Main Belting Company  
*Size Material:* From 5" to 18"

A scientific belt, correctly installed, made it all possible. The exact width, ply, speed and *troughing*

*angle* for the work were all figured. Now-a-days belts are not troughed up to such an angle that they crease and finally crack lengthwise before they wear out. Just enough troughing to prevent spillage is used.

This company is the only belting concern making its own rollers. These are made and so adjusted as to give maximum life to the belt.

The Leviathan man will be glad to figure on all your belting problems, including conveying.



**MAIN BELTING COMPANY** . . . **Philadelphia**  
New York Boston Chicago Pittsburgh Atlanta San Francisco



*For better service say, "I saw it in ROCK PRODUCTS"*



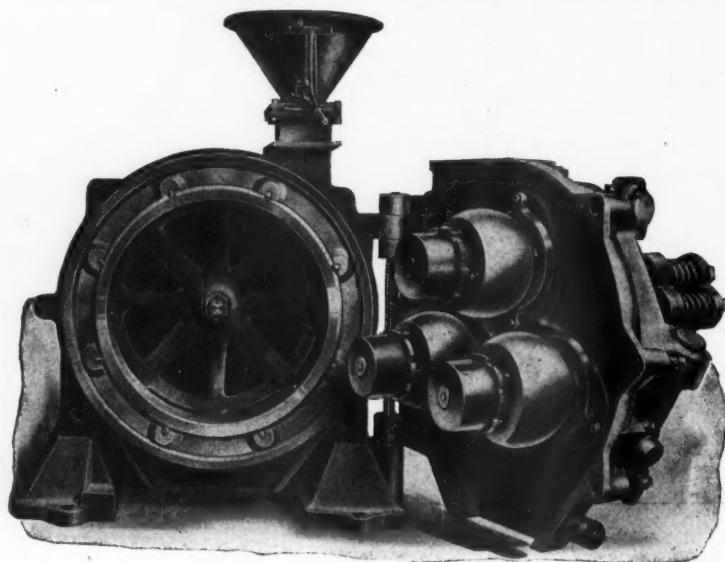


**"ONE MAN - ONE MINUTE"**



# STURTEVANT "OPEN-DOOR" MACHINERY

## "Open-Door" Sturtevant Ring-Roll Mills

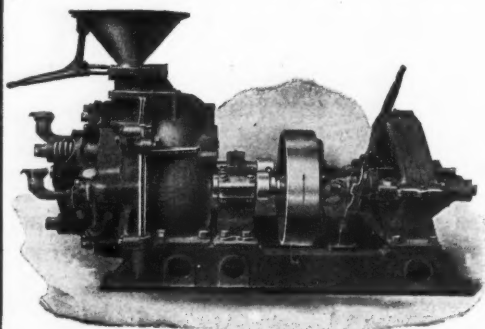


Patented

Release the bolts, throw open the door and every wearing part is within easy reach. One man can open a five ton door in a very few minutes.

Is this not a time and labor saver? Can anyone afford a machine that takes hours and sometimes days to get into?

They are slow speed durable machines crushing by spring pressure and not by centrifugal force.



Patented

Ring-Roll Mills are used for pulverizing hard or soft substances from 1 1/2 inch to 80 mesh or coarser. For Cement Clinker, Limestone, Phosphate, Trap, Granite, Feldspar, Fire Clay, Shale, etc., etc. Built in 5 sizes—capacities 1 to 25 tons per hour.

**SEND FOR CIRCULAR**

**STURTEVANT MILL CO., BOSTON MASS.**  
HARRISON SQUARE

*The advertiser wants to know that you saw his ad in ROCK PRODUCTS*



**Send more shells! "**  
**-- and Worthington equipment**  
**delivered**

**W**HEN the one biggest thing was to advance the lines—when enemy shells were dropping thick and fast and our guns were returning two for one—what could have seemed more commonplace than a water pump three thousand miles away.

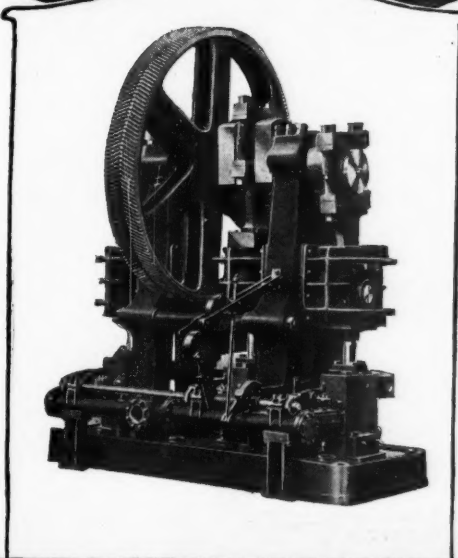
Yet in those early days of the war—when every delay was a national setback—many of the pumps built in record time by Worthington were vital even to the production of front line munitions. Especially was this so of the high pressure pumps supplied by our Deane Works.

For while Worthington pumps in government factories furnished hydraulic power for smokeless powder presses, Worthington pumps in various shops gave life to the mighty hammers where shells were forged. Other Worthington pumps found varied war use both at home and abroad—from pumping oil on destroyers to unwatering dry docks.

It is peculiar of Worthington products that while they were vital to winning the war, they are equally as essential to peace-time industry. Now with eight enormous factories of greatly enlarged capacities and increased facilities for emergency production, Worthington is better prepared than ever to resume its position as world-wide headquarters for industrial equipment.

**WORTHINGTON PUMP AND MACHINERY CORPORATION**

*Executive Offices: 115 Broadway, New York City*  
*Branch Offices in 24 Large Cities*



**PUMPS—COMPRESSORS—CONDENSERS—METERS—OIL & GAS ENGINES—MINING MACHINERY**

# WORTHINGTON



Worthington Works, Harrison, N. J.  
 Blake & Knowles Works, East Cambridge, Mass.  
 Deane Works, Holyoke, Mass.  
 Hazleton Works, Hazleton, Pa.

Snow-Holly Works, Buffalo, N. Y.  
 Laidlaw Works, Cincinnati, Ohio.  
 Power & Mining Works, Cudahy, Wis.  
 Erie Engine Works, Cudahy, Wis.

*You will get entire satisfaction if you mention ROCK PRODUCTS*

# BROWNING

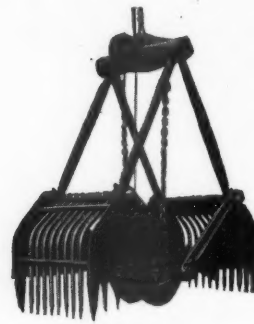
## "BUCKETS THAT BITE"



Browning Reeved Type  
Bucket



Browning Flat Chain  
Clam Shell Bucket



Browning Coke  
Fork



Browning  
Wood Grapple

DO you realize what a difference there may be in apparently similar buckets?

It is a fact that it is the "biting" power of your buckets which determines your profits. A bucket which fails to "bite 100%" is a money-loser for you. The dollar value of a bucket to you depends on its ability to do three things—to grab full

loads—to grab them quickly—and to stand up under brutal usage.

Browning Buckets have rugged strength combined with lightness—a remarkable combination. Specially selected materials treated by special processes which make them so strong that lighter parts may be used; a design that gives great closing power with fewer parts—these are the points that have won a world-wide reputation for Browning Buckets.

**THE BROWNING COMPANY**  
CLEVELAND, OHIO

Sales Offices: New York, Chicago



**THE  
BROWNING**  
Locomotive Crane  
"The All-Around Champion"

"There's a bucket for every purpose."

The "Browning" Bucket Catalog will give you the full details of each bucket.

Write for it.

Prompt attention will be given your inquiry if you mention **ROCK PRODUCTS**

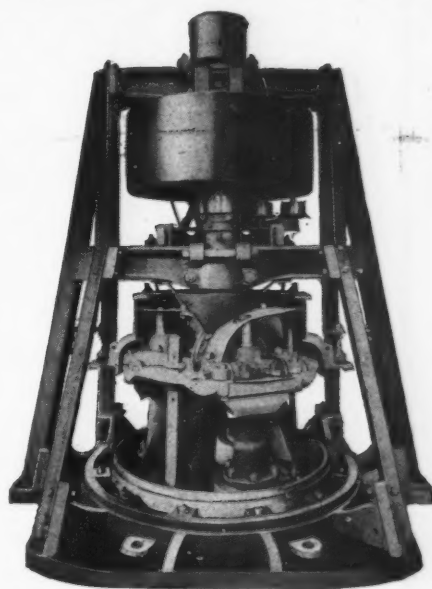




**MOST EFFICIENT OF ITS TYPE  
EVER BUILT—LATEST AND BEST  
CONSTRUCTION THROUGHOUT—  
NEW, EXCLUSIVE, PATENTED DE-  
VICES—SIMPLE IN OPERATION  
—ECONOMICAL IN POWER—A  
COMPLETE UNIT IN ITSELF.**

## *A Few Pointers*

**YOU** will like the Bradley for the same reasons that producers who already use it, like it. It produces feed material of 3-4 inch size and reduces it speedily to the desired fineness in one operation.



# The BRADLEY 3-Roll Pulverizer Mill

accomplishes this result without apparent effort; with a remarkably small consumption of power; without breakdowns that bring costly delays.

It produces 5 tons per hour, working

on phosphate rock. 6 to 8 tons when pulverizing limestone for agricultural purposes. These quantities are produced at a lower cost than obtained by many mills producing far coarser material.

*Catalogue, Prices and Engineers Await Your Word*

**BRADLEY PULVERIZER COMPANY**

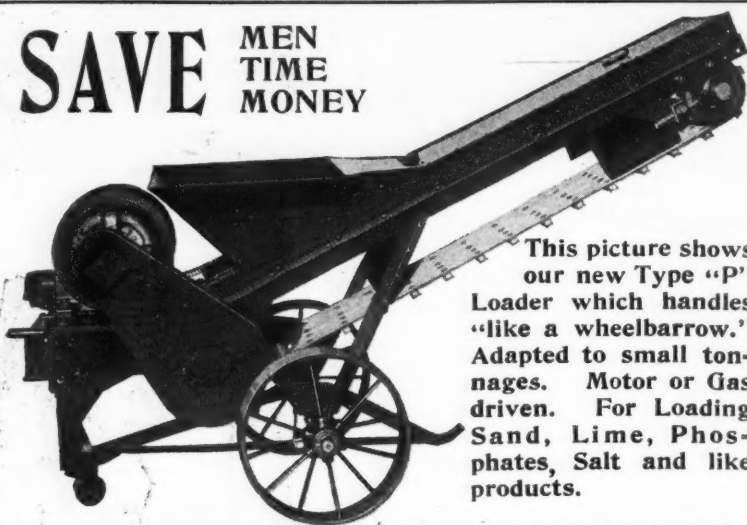
BOSTON, MASS.

Works: Allentown, Penna.

LONDON, ENGLAND

# THE MANIERRE BOX CAR LOADER

**SAVE** MEN  
TIME  
MONEY



This picture shows our new Type "P" Loader which handles "like a wheelbarrow." Adapted to small tonnages. Motor or Gas driven. For Loading Sand, Lime, Phosphates, Salt and like products.

Men are sure to be scarce. These machines will do the work of many without breaking up and degrading your product.

They will pay for themselves rapidly.

## THE MANIERRE BOX CAR LOADER

is made in 7 standard types. It is of simple construction of the finest materials and workmanship and can be easily adapted to any special local conditions.

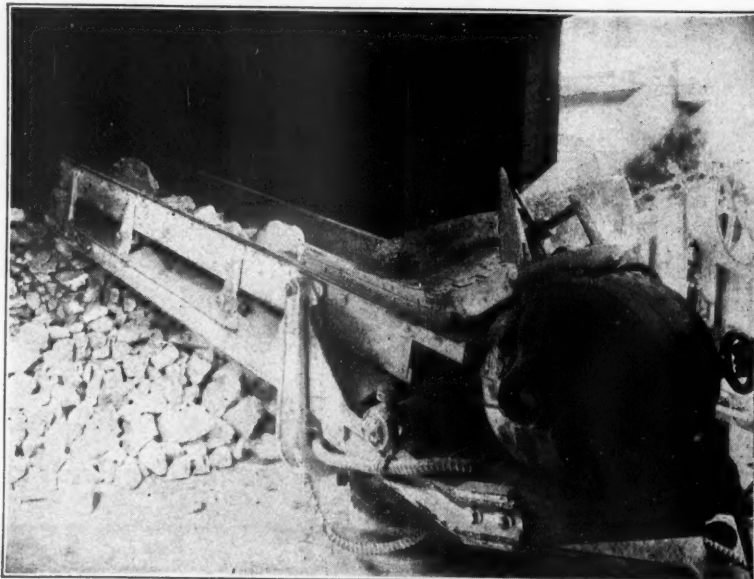
We build several machines that will load Lime, Phosphates, Salt, and Sand, Gravel and heavy materials. Our machines have demonstrated their capacity and value in many fields.

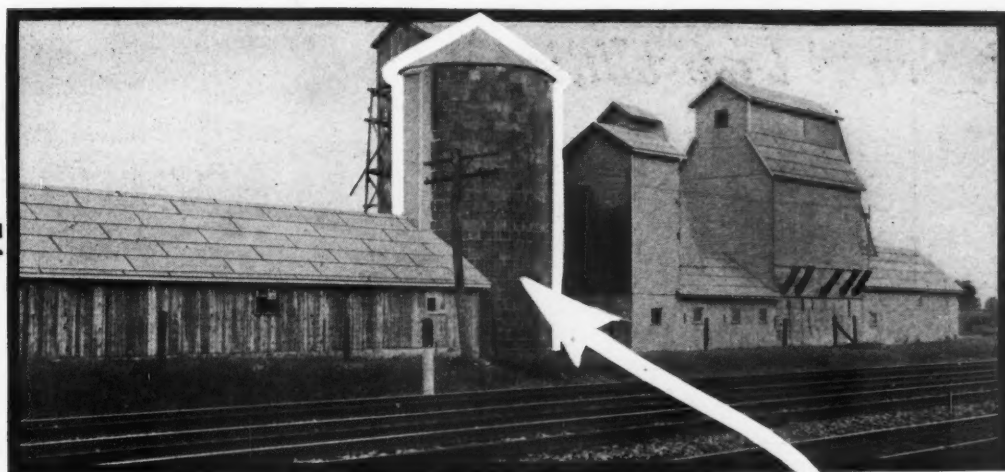
The 24" Belt Loader at the right has been doing satisfactory work for six years at the Chas. Warner Company's plant, Devault, Pa. Lime drawn from cooler into cars from which it is dumped into specially designed cooling bins. It is drawn off automatically and travels on pan conveyor where it is picked to shaker screen from which it passes down chute to loader.

**MANIERRE**  
ENGINEERING &  
MACHINERY CO.  
MILWAUKEE, WIS.

### REPRESENTED BY

The Link Belt Co., Chicago; Philadelphia, Pittsburgh, Pa.; Portland, Oregon; Seattle; British Columbia; Lindrooth, Shubart & Co., Denver; Calgary Machinery & Mfg. Co., Alberta; Yourveta Home & Foreign Trade Co., Inc., New York.

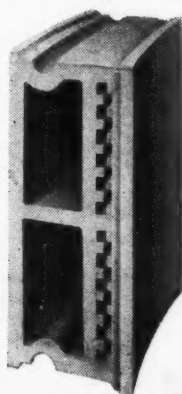




Photograph of the Becker Limestone Co., Lincoln Park, N. Y.

## Storage of Lime, Grain, Chemicals

Wool Waste, Coal, etc., are best effected in Preston Lansing Vitri-fied Tile Storage Bins. Any material, dry or liquid, regardless of weight or nature, can be more economically and more safely stored in a Lansing. It is fireproof, rot proof, water and air tight and almost wear proof.



**The Lansing Block**

Note the deep groove in top and bottom for extra thick layers of cement. The fluting which keeps mortar from slipping.

Preston Lansing Special Ship Lap and Tongue and Groove design of joints make it easy for masons to build a moisture-proof joint. The heavy square twisted steel reinforcing bars placed in each horizontal joint insure lateral strength beyond the pressure of any material stored in bins.

The three upright and horizontal walls of each block give a crushing strength equal to any load you desire to place on top of bins in the way of working house or machinery. And the two dead air spaces created thoroughly insulate the bins against moisture, sweating or change of temperature, and maintain a uniform temperature in the bins—keeping them warm in winter and cool in summer.

Blocks are also made without curvature for use in building of top working houses or of warerooms, offices, etc., so that your entire plant may be constructed of the same fireproof material.

Send us your requirements and get special quotation before making your decision of material

**J. M. PRESTON COMPANY**  
Dept. 416 Lansing, Mich.  
Factories in Uhrichsville, Ohio; Brazil, Indiana, and Ft. Dodge, Iowa

# PRESTON Lansing Vitrified Tile Bins

Saying, "I saw it in ROCK PRODUCTS," will bring quick action



*"Built to Dry at Lowest Ultimate Cost"*



# Ruggles-Coles Dryers

Repairs minimized. Realize what that means. Our twenty-two years of consistent effort to eradicate weaknesses in Ruggles-Coles Dryers means *practically no interruption of production.*

We are now turning out dryers that will run twenty-four hours per day for years with very slight cost for repairs and renewals.

We guarantee that no Ruggles-Coles Dryer will break down due to defective design or weak parts. We also guarantee that these dryers will burn less fuel and consume less power than any other type of dryer.

*Our illustrated catalog gives you the complete story—  
all about the mechanical advantages—the various  
models and sizes—everything you want to know. So  
get a copy at once.*

## Ruggles-Coles Engineering Co.

McCormick Bldg., Chicago

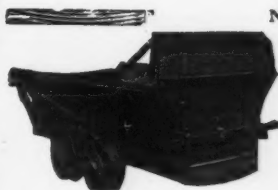
50 Church St., New York

Worke, York, Pennsylvania

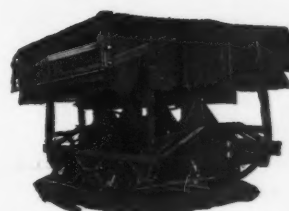
# Watt Cars



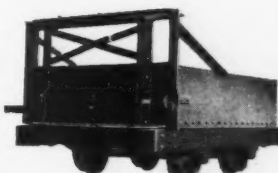
No. 77-R



No. 514-R



No. 146-R



No. 463



Get the Watt Catalogs you desire.  
A—Mining Cars. B—Industrial Cars.  
M—Ore Cars. S—Wheels. W—  
Couplings.

## Watt Mining Car Wheel Co.

Main Office and Works: BARNESVILLE, OHIO

SAN FRANCISCO

N. D. Phelps  
Sheldon Bldg.

DENVER

Lindrooth, Shubart & Co.  
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PHILADELPHIA

Edelen & Co.  
235 Commercial Trust Bldg.

You will like the Watt Cars that come into your plant. For before they arrive, they will have been made to measure, to fit your plant.

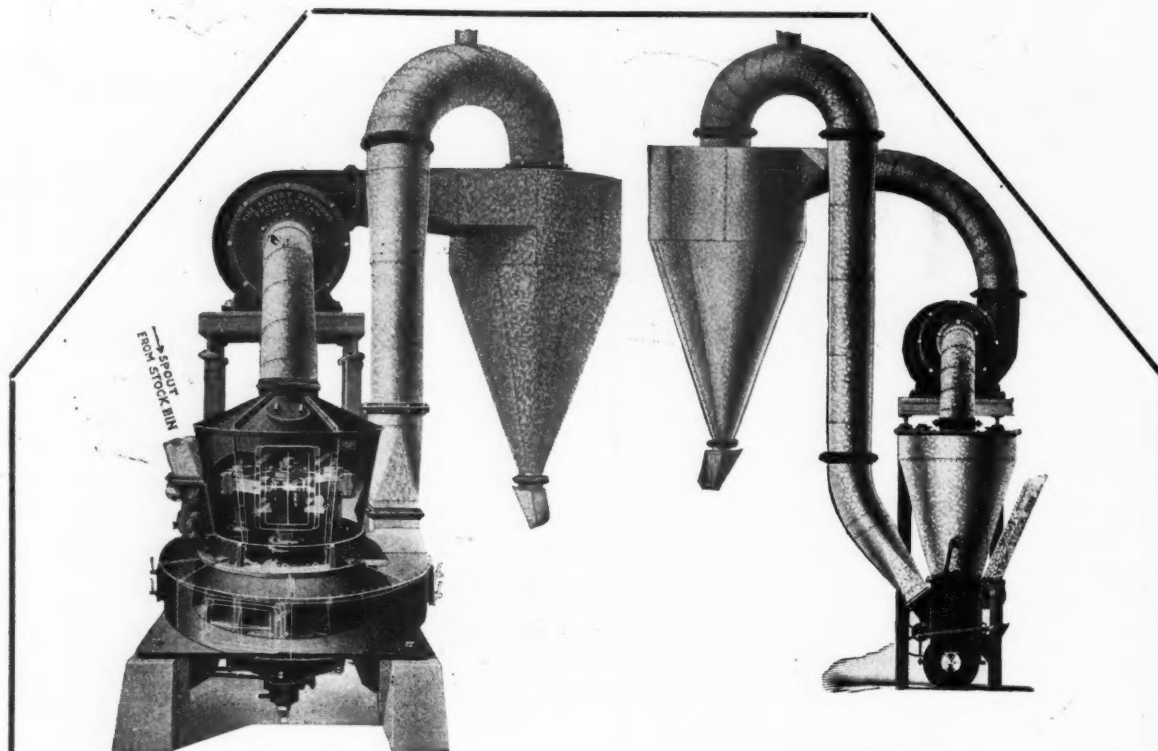
There's no guesswork. Even the size and weight of the average rock, banged into your cars by the shovels, are taken into careful consideration.

Result: Long wear, perfect co-ordination, quick haulage, no breakdowns.

For better service say, "I saw it in ROCK PRODUCTS"

## RAYMOND PULVERIZING AIR SEPARATING SYSTEM

## RAYMOND PULVERIZING AIR SEPARATING SYSTEM



Raymond Roller Mills equipped with Air Separation are producing large economies in the grinding of coal, gypsum, limestone, phosphate rock and many similar products.

They handle these materials in one operation automatically and without dust. The material is fed in with an automatic feed, ground to a powder, air separated to produce uniformity and delivered dustlessly to a conveniently located storage bin.

If you have a fine grinding proposition and are looking for the best machinery with lowest ultimate cost, ask us for a recommendation and quotation.

For Hydrated Lime the Raymond Automatic Pulverizers have proven themselves to be the very best and most economical machine on the market. They are employed in over 90% of the hydrated lime plants of the country and have replaced every known type of equipment used for this purpose.

These pulverizers are complete units combining grinding, screening and elevating operations. They air separate the hydrate, cleaning out core, sand and unburned lime and elevate the finished product to storage bins.

Full information will gladly be sent.

**EVERY RAYMOND MILL IS COVERED BY AN ABSOLUTE  
GUARANTEE BASED UPON PAST PERFORMANCES**

**RAYMOND BROS. IMPACT PULVERIZER CO.**  
1301 North Branch St. Chicago, Ill.

Western Office: 202 Boston Bldg., Denver, Colo.

*The advertiser wants to know that you saw his ad in ROCK PRODUCTS*





## —AND NOW THE OSGOOD STEAM-SHOVEL GETS ON THE JOB!



**A** FEW of the important features found in the Osgood "18" that are also found in the larger types of Osgood Shovels:

Independent hoisting, swinging and boom engines.

Horizontal hoisting engines.

Machine cut gears and pinions.

Combination boom made of steel and oak, fitted with two shipper shaft gears.

Hoisting throttle with lowering control.

Steam friction clutch for hoisting drum.

Pump and injector for feeding boiler.

Sight feed oil pump for lubricating engines.

# OSGOOD

**O**SGOOD SHOVELS are considered the most dependable to be found. They do the work of many laborers and work at top efficiency in extremely cold or hot weather—or in temperatures between.

The Osgood "18," 3/4 yd. Traction Revolving Steam Shovel is particularly successful where the crushing capacity is from 200 to 500 tons per day.

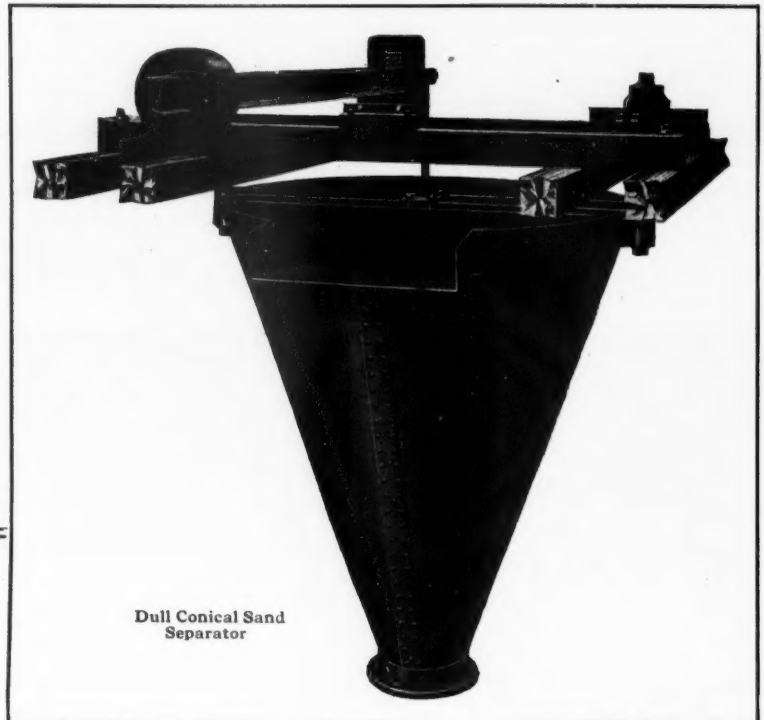
Write today for copy of New General Catalog C-1

## THE OSGOOD CO., MARION, OHIO

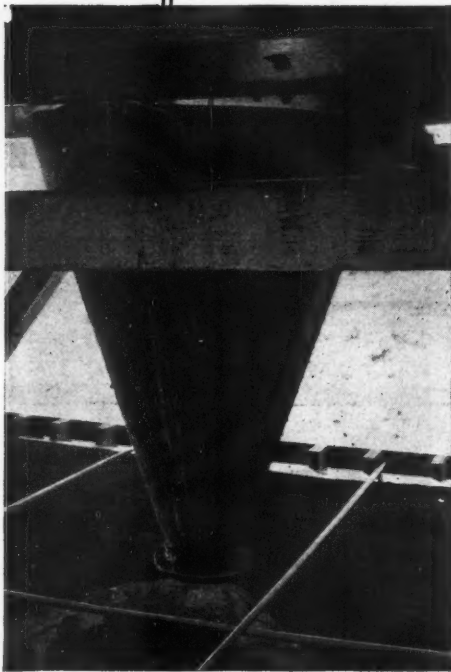
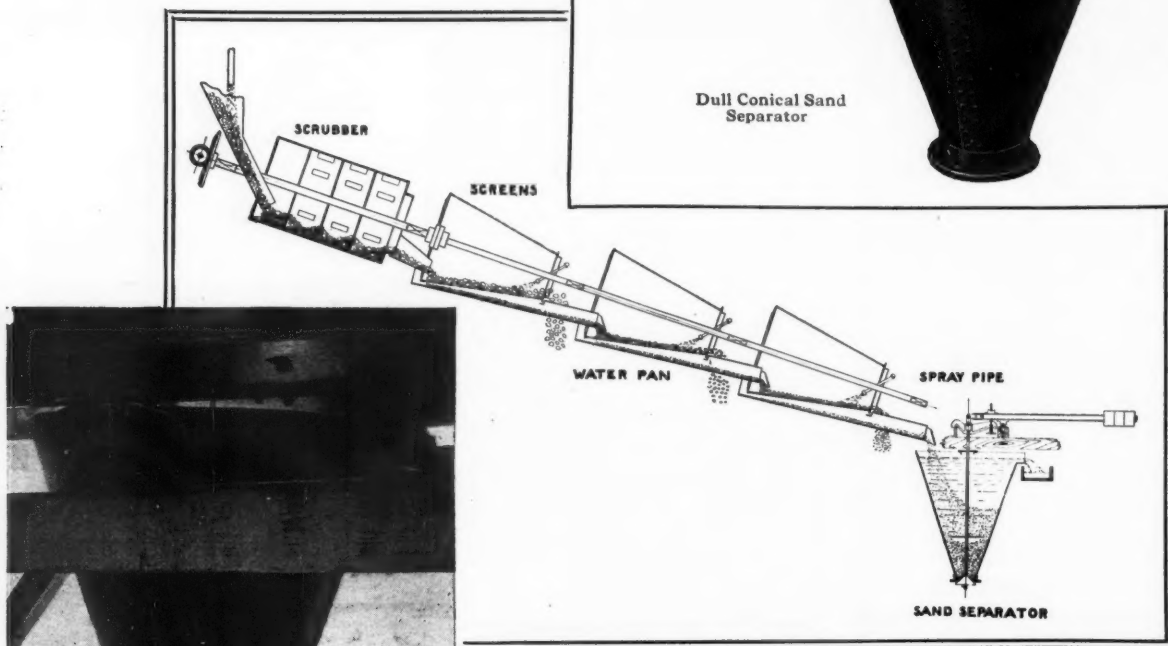
## Dull Conical Sand Separators

ONE of the most important parts of a washing plant is the sand separator. A poor separator will spoil material in the bins as fast as it is prepared.

The Dull Conical Sand Separator is the result of years of development in an effort to produce a separator which would prove thoroughly practicable and reliable and entirely automatic in its operation.



Dull Conical Sand Separator



How the Dull Conical Sand Separator Discharges Automatically to Bin Below

Its universal use in many of America's leading sand washing plants has caused it to be considered the recognized standard in its field.

Write for our Book No. 17 giving full details. Call upon our washery engineers for assistance in planing any addition to your present plant or designing an entirely new one. We are sand and gravel washery experts.

### LINK-BELT COMPANY

242

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2d National Bank Bldg.  
429 Rockefeller Bldg.  
332 Dime Bank Bldg.  
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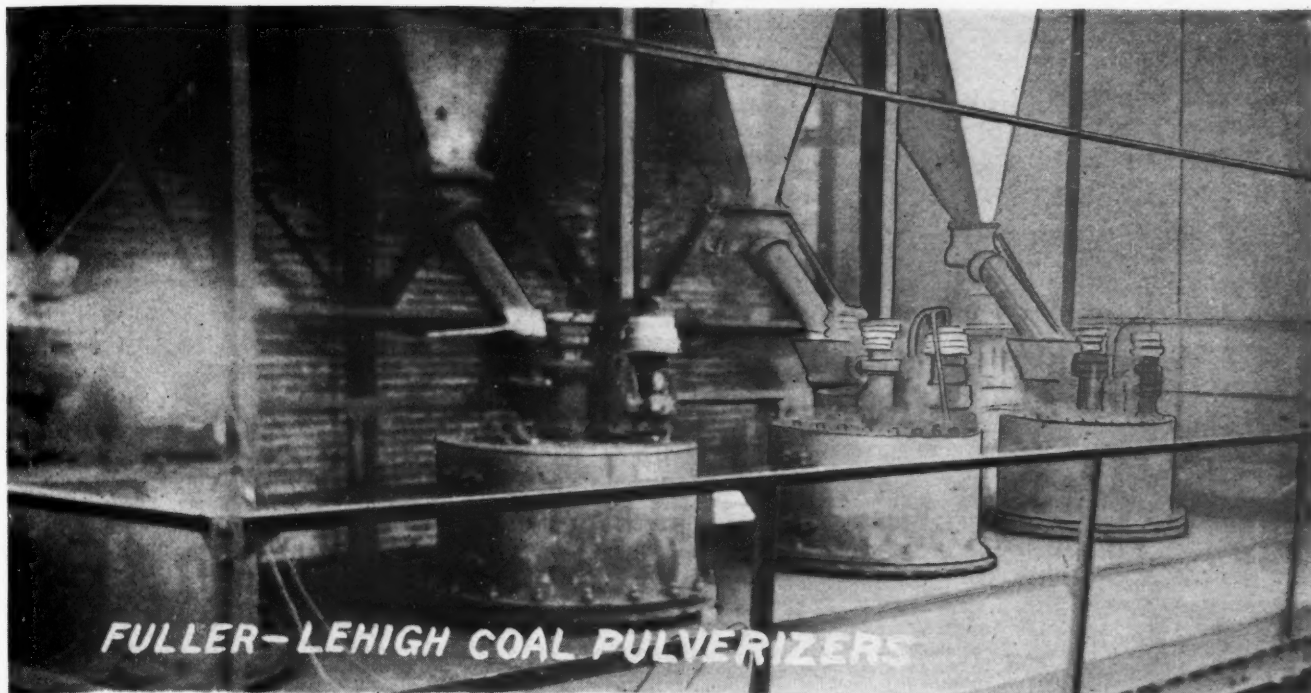
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# LINK-BELT

## SAND AND GRAVEL PLANTS

Prompt attention will be given your inquiry if you mention ROCK PRODUCTS



At the U. S. Nitrate Plant, Muscle Shoals, Ala.

# FULLER-LEHIGH PRODUCTS

**P**ROBABLY in no other plant of any sort in this country was ever gathered a more choice assemblage of equipment. The government gave costs no consideration. Equipment that could produce to the utmost in quality and quantity was wanted.

The selection of Fuller-Lehigh Dryers and Fuller-Lehigh Coal Pulverizers was an especial triumph because Uncle Sam could have paid more had he wanted to. But his experts knew there was none so good as Fuller-Lehigh products.

Take a Tip!

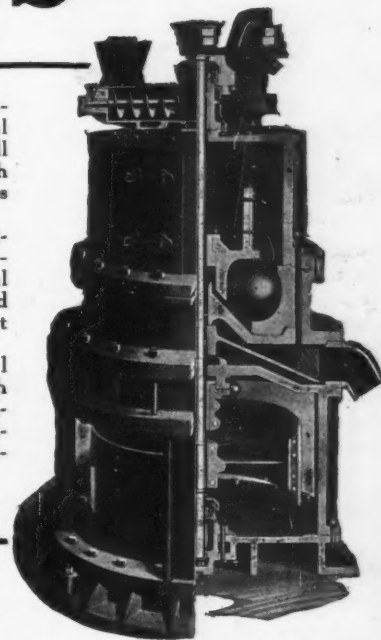
■ ■

**I**F you intend to produce agricultural limestone you will find the Fuller-Lehigh Pulverizing Mill has no equal.

Requires no outside accessory equipment. All material discharged is finished product of highest quality.

Built in several sizes, all of which grind to meet specifications of agricultural experiment stations.

Ask for Catalogue



## FULLER-LEHIGH CO.

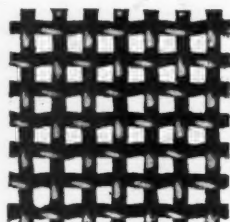
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Fullerton, Penna., U. S. A.

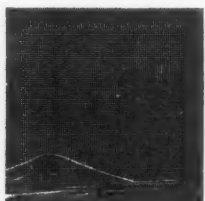
Branches: New York City, U. S. A.—50 Church Street. Parsons, Kans, U. S. A.—First Nat. Bank Bldg. Chicago, U. S. A.—1336 McCormick Bldg. London—25 Victoria St., Westminster, S. W. 1, England

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry

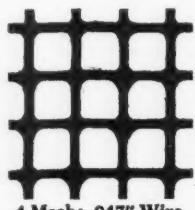
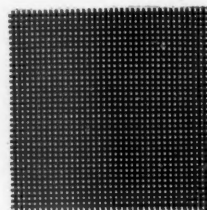




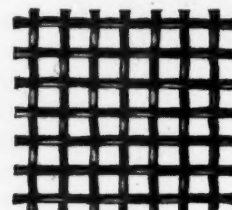
6 Mesh; .080" Steel



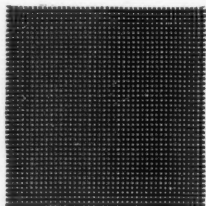
100 Mesh; .0045" Brass

4 Mesh; .047" Wire  
Galvd. After Weaving

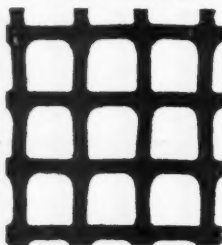
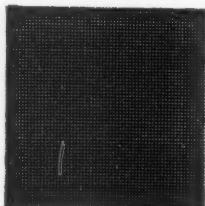
40 Mesh; .0135" Steel



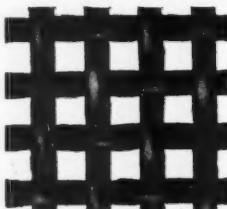
6 Mesh; .054" Steel



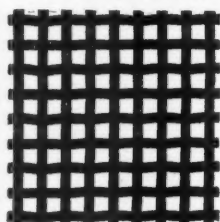
45 Mesh; .011" Steel

3 Mesh; .080" Wire  
Galvd. After Weaving

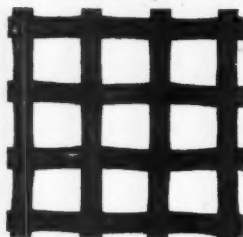
60 Mesh; .008" Steel



3 1/2 Mesh; .135" Steel



8 Mesh; .054" Steel



3 Mesh; .105" Rolled

# "TYLER"

DOUBLE CRIMPED WIRE CLOTH : TON-CAP SCREEN TESTING SIEVES : TESTING  
SIEVE SHAKERS : INCLINED VIBRATING SEPARATORS

## SELECTION OF SCREENS

Economical screening depends largely upon the selection of the proper screens and proper screening device. It is just as much a part of the service of The W. S. Tyler Company to furnish information about screen problems as it is to build screens, and every assistance will be rendered the screen users in determining the best screen for their requirements.

Tyler "double crimped" wire cloth is made in all meshes, in all metals, and for all uses. Samples of any mesh or metal will be gladly mailed upon request.

## HUM-MER SEPARATOR

DRUMHEAD TENSION—ELECTRIC VIBRATION  
SCREENS ALL DRY MATERIALS

To obtain maximum capacity from a wire cloth screening surface, the essential requirements are that the screen cloth be tightly stretched and effectively vibrated.

In the HUM-MER, the combination of "drum-head" tension with electrical high-speed vibration, produces a character of vibration and a character of sorting action far more effective than can be obtained with any bumping, shaking, or mechanically vibrated screen.

Fine material can be screened as effectively as coarse material on the HUM-MER—in fact, it will handle all dry materials.

Full particulars sent upon request.

## RO-TAP TESTING SIEVE SHAKER

The RO-TAP Testing Sieve Shaker represents the modern method of making screen analyses. This machine reproduces the circular and tapping motion given testing sieves in hand sieving, but with a uniform, mechanical action. Results obtained with the RO-TAP can be duplicated and standardized; losses due to errors in testing can be eliminated; and, while the test is being run, the operator is free to do other work.

Write for full particulars.

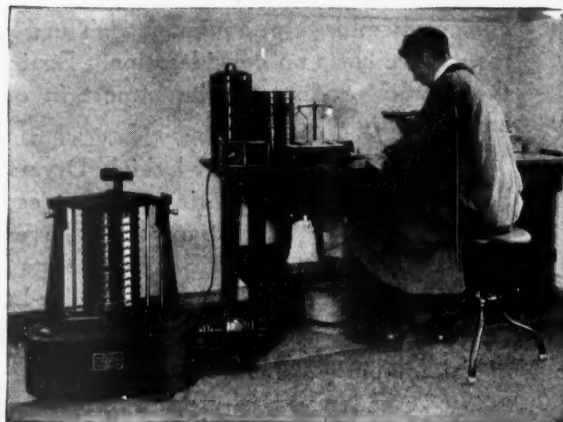
## TYLER STANDARD SCREEN SCALE TESTING SIEVES

These sieves are made with openings that increase and decrease in the fixed ratio of the square root of 2 and are much more reliable and dependable than a sieve series with no relationship between the openings.

Write for No. 36 Testing Sieve Catalogue.



Patents Pending  
HUM-MER Separator—Showing operator bringing  
screening surfaces to drumhead tension



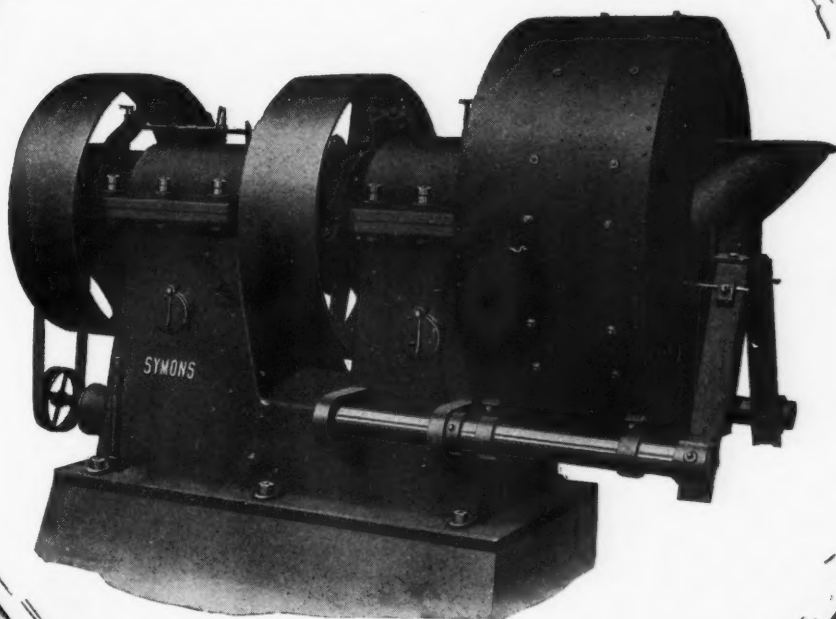
Ro-Tap Testing Sieve Shaker testing seven samples with  
one operation of the machine. No attention required on  
the part of the operator

**The W. S. Tyler Company**  
Cleveland, Ohio

*It gets immediate attention if you mention ROCK PRODUCTS*

# SERVICE

## SYMONS DISC CRUSHER



*"The Master Crusher"*

**Record of One 48" Crusher in the Field**

Material Crushed, Lime-stone.

Length of time operated, 3 years.

Size of feed, 4".

Size of product, 1 1/2".

Horsepower used, 65.

Tons crushed per set of discs, 750,000.

No lost time on account of breakage.

We also build them in 18" and 36" size.

**Record of One 24" Crusher in the Field**

Material Crushed, Gravel and hard heads.

Length of time operated, 2 years.

Size of feed, 2".

Size of product, 1/2".

Horsepower used, 20.

Tons crushed per hour, 25.

Original crushing discs still in use.

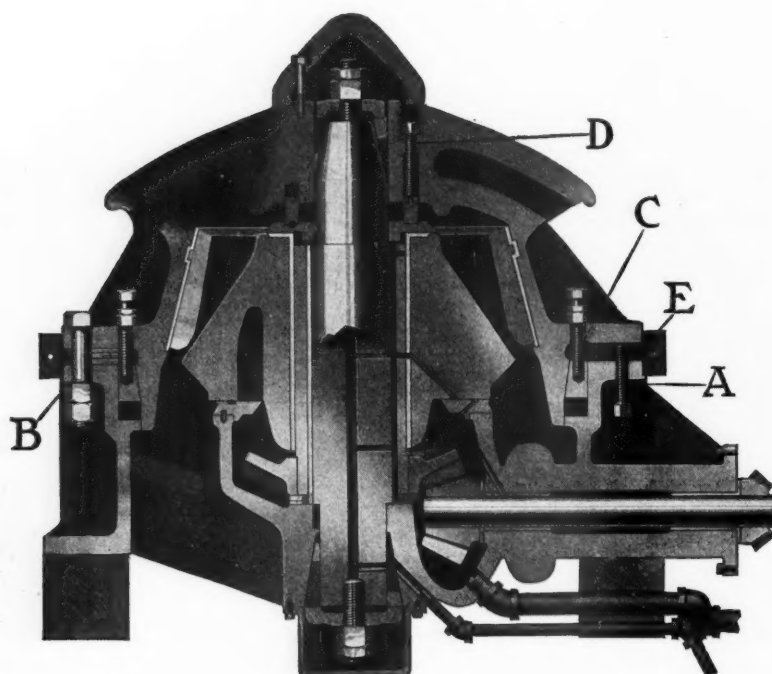
No lost time on account of breakage.

Customer says: "Superior to Rolls, Jaw or Gyratory Crushers on this class of work."

MANUFACTURED AND SOLD ONLY BY

**Chalmers & Williams**

1425 Arnold St., Chicago Heights, Ill.



## Simplicity in Secondary Crushers

Just a short, heavy frame, an unbreakable pillar-shaft, a sleeve-eccentric turning on the shaft and an umbrella head, gyrating horizontally — that's the Telsmith Reduction Crusher.

Just five reasons why it excels in secondary crushing—(1) the reduced weight in rotation; (2) its short structure and tremendous strength; (3) its big receiving opening and free gravity feed; (4) its unobstructed gravity discharge; (5) its big crushing diameter and large capacity.

Just its simplicity, plus the five features mentioned—these things make Telsmith the ideal secondary crusher.

Just Bulletin No. 2-F-11 to tell you all about Telsmith Reduction Crushers. Glad to mail it to you, with our Catalog No. 166 covering Telsmith Primary Breakers.

### Smith Engineering Works

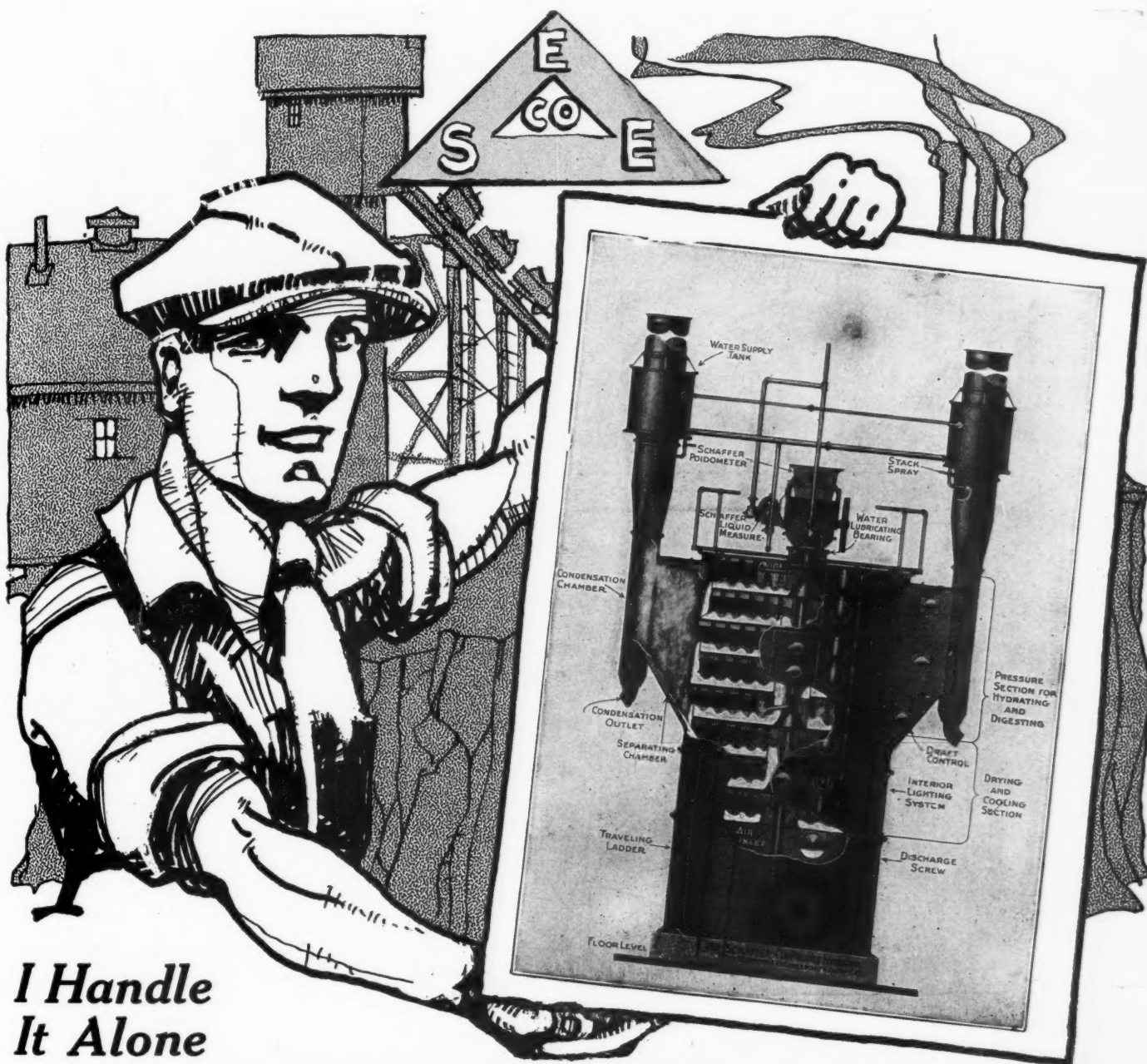
3188 Locust St.

Milwaukee, Wis.

545 Old Colony Building, Chicago, Ill.; 30 Church St., New York City; 710 Witherspoon Building, Philadelphia; Garfield Building, Cleveland, Ohio; Franklin and Channing Aves., St. Louis, Mo.; 325 W. Main St., Louisville, Ky.

Cooperation is the thing—please mention ROCK PRODUCTS





***I Handle  
It Alone***

## THE SCHAFER AUTOMATIC CONTINUOUS LIME HYDRATOR

It is characteristic of all Schaffer Equipment to operate automatically. The Schaffer Hydrator is typical in this respect.

With the mechanical operation comes mechanical precision. No guessing. The lime is delivered by weight instead of volume—a far surer means of obtaining correct proportion.

Water flows under automatic control. Just exactly the proportionate amount desired.

Schaffer Hydrators are so flexible as to control that either high calcium or dolomite lime can be used with equal success.


Solve your labor problem and achieve unequalled results by hydrating with a Schaffer. Literature awaits you.

Write to the

**SCHAFER ENGINEERING & EQUIPMENT CO.**  
Peoples Bank Building Pittsburgh, Pennsylvania

*For better service say, "I saw it in ROCK PRODUCTS"*

# USE S-A



## S-A Products in the U. S. Nitrate Plant

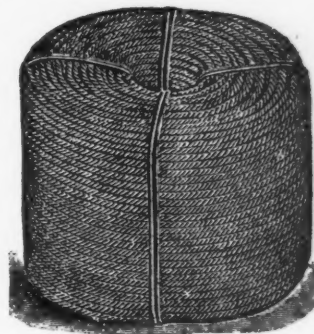
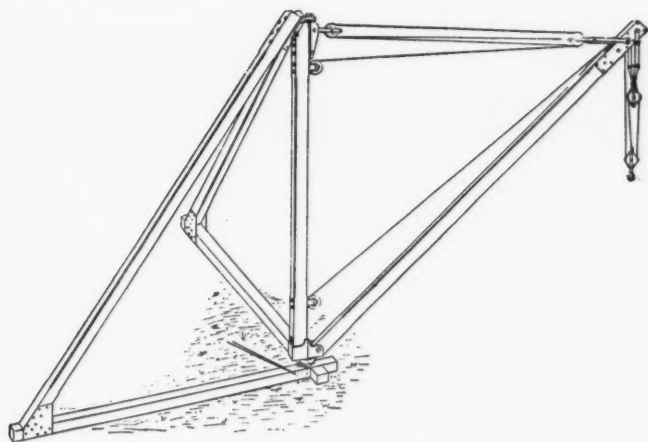
Here you see an S-A Shuttle Conveyor in the lime kiln building of the U. S. Nitrate Plant at Muscle Shoals, Ala.

Uncle Sam insisted upon the best equipment, giving particular attention to the design, rugged construction and the established reputation of all the products involved. Consequently S-A Products were given preference.

Conclusive evidence that S-A Equipment is superior.

**Stephens-Adamson Mfg. Co.,      Aurora, Ill.**

Elevating, Conveying, Screening and Transmission Machinery of every nature.  
Pioneers in the design and manufacture of gravel washing and screening plants



## Now's the Time

to install that new hoist or derrick,  
or to put on that new cable, etc.

Our line of machinery and  
equipment for Sand and Gravel  
Pits, Stone Quarries, etc., is most  
complete.

## Whatever You Need

in your plant you'll find in the  
1100-page catalog of

**GEO. B. CARPENTER & CO.**

440 N. Wells St.

Chicago



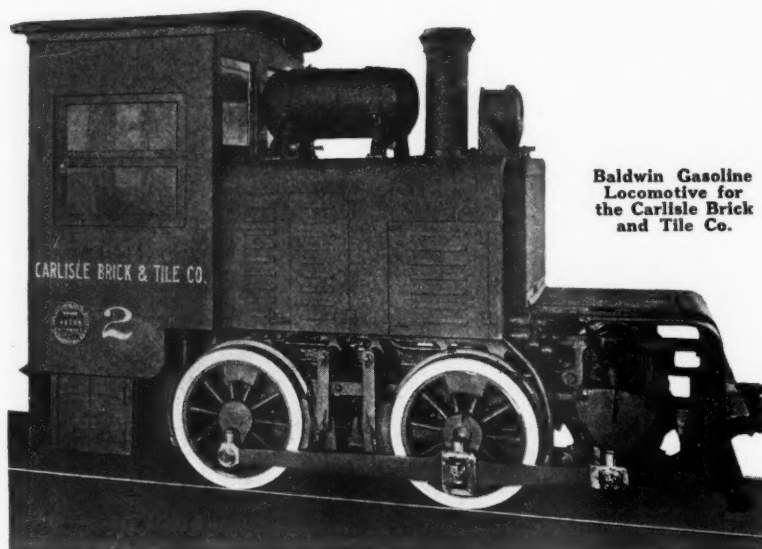
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Send now for our  
new General Cata-  
log No. R-110.

*You will get entire satisfaction if you mention ROCK PRODUCTS*



# Another Baldwin on the Job



**T**HE real test of efficiency is that of actual service. And when a locomotive stays on the job and gives satisfaction in contractors' and industrial work, where the conditions are unusually severe, it is sure proof of the fact that it is properly designed and strongly built.

The Carlisle Brick and Tile Co. are using a Baldwin Gasoline Locomotive in their plant at Carlisle, Iowa. Under date of April 21, 1919, they write as follows regarding the work done by this machine:

"We have had your 5-ton gasoline locomotive in use here at our plant for more than a year and are getting wonderful results from its use. We haul our clay a little more than a mile and have sharp curves and a long 5 per cent grade.

"We are now hauling a 12-ton load up this 5 per cent grade and getting wonderful results.

"We would be pleased to recommend your locomotive to any concern who has a haulage proposition."

No comments of ours on this letter are necessary. We would only add that Baldwin Internal Combustion Locomotives are built in five standard sizes, weighing from 5 to 25 tons—a range sufficient to adapt them to a variety of service conditions. The fact that they consume no fuel while standing idle fits them especially for light work where service requirements are intermittent, but where the locomotives must be ready for operation at any time.

Further particulars will be  
gladly furnished on request

## The Baldwin Locomotive Works

Philadelphia, Pennsylvania

*Prompt attention will be given your inquiry if you mention ROCK PRODUCTS*



# PLYMOUTH

## *Gasoline Locomotives*

### Volume—Speed—Profits

Work doesn't often pile up for The Brokensword Stone Co., Bucyrus, Ohio—its steam shovel, its two "Plymouth" Gasoline Locomotives and its long trains of cars keep things hustling right ahead, hour after hour.

At this plant, one "Plymouth" handles 500 to 700 tons a day. The haul is 2,000 feet long—much of the track is rough, with sharp curves, but the Locomotive uses only about 7 gallons of gasoline daily. Officials declare "Plymouths" the best on the market.

Efficient locomotive equipment will help *you* get out more material—hold production steady; keep overhead costs down; increase plant profits.

Scores of "Plymouths" are doing splendid work for stone and cement companies; dozens more in sand and gravel plants. Write, describing your haulage conditions fully and we will send you an interesting book describing and picturing "Plymouth" service in many big plants.

**THE J. D. FATE COMPANY, 210 Riggs Avenue, PLYMOUTH, OHIO**

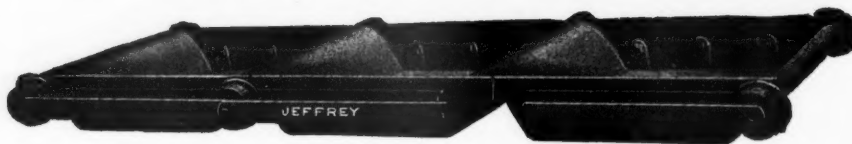
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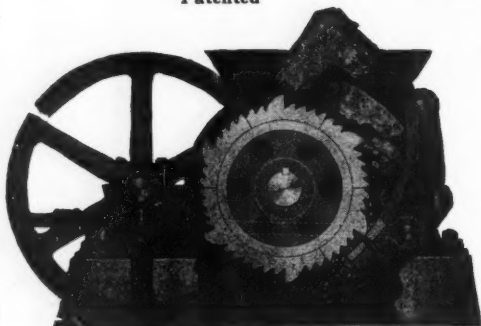
# The Lime Plant at U. S. Nitrate Plant No. 3—Muscle Shoals

Designed by the Fuller Engineering Company  
(And Described in This Issue)  
Is Equipped With

## JEFFREY Crushing, Elevating and Conveying Machinery



Patented



Single Roll Coal Crusher  
Preliminary to Dryers and Fuller  
Mills

In addition to Jeffrey Bucket Elevators, two Jeffrey Cast Iron Pan Conveyors similar to the above illustration are used in this lime plant for handling burnt lime. They are each 201 ft. centers, consisting of 18 x 18-in. pans mounted upon No. 182 1/2 Steel Thimble Roller Chain; travel approximately 80 ft. per minute, and have a capacity of 40 tons of 1 1/4-in. burnt lime per hour.

At the No. 1 and No. 3 United States Nitrate Plants at Muscle Shoals and Sheffield, Ala., will also be found Jeffrey Coke Crushers, Transmission Machinery, Coal Handling Equipment, including Track Hopper, Feeder Conveyor, Crusher, V-Bucket Elevator-Conveyor, Belt Conveyor, etc.

Send for latest catalogs  
on Jeffrey Equipment

**The Jeffrey Mfg. Co., 935 No. Fourth St., Columbus, O.**

New York  
Boston  
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Philadelphia  
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Milwaukee

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*It gets immediate attention if you mention ROCK PRODUCTS*



# Rock Products

TRADEPRESS PUBLISHING CORPORATION  
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CHICAGO

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Vol. XXII, No. 14

July 5, 1919

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# Service

## Audubon Double Crimped Wire Cloth



*Quality  
Service Satisfaction  
Guaranteed*

Because we use the very finest wire as our basis and then skillfully and perfectly weave it, incorporating the double crimp to add life and service, we achieve what is known to the trade as the wire cloth supreme—Audubon.

The combined result of good material, correct manufacturing methods, and skilled hands naturally makes for a perfect product. That's logical. This extra margin of worth is yours to take advantage of without extra cost.

### AUDUBON WIRE CLOTH CO., Inc.

MANUFACTURERS OF

Wire Cloth and Screening in all sizes and meshes made of Iron, Steel, Brass, Copper, Galvanized and Special Metals. Rock, Crushed Stone, Sand and Ore Screens. All grades Sieves and Riddles. Factory and General Offices—

AUDUBON, N. J.

4 Miles from Philadelphia, Pa.

# Rock Products

Vol. XXII

Chicago, July 5, 1919

No. 14

## The Future of the Lime Association

Shall It Be a Strong Central Organization of the Whole Industry or a Weak Association of Rival Groups?

IT IS PROBABLY a surprise to the rock products fraternity in general to know that any doubt exists in the minds of members of the Lime Association as to continuing that organization on its present or even a more generous basis, after the remarkable demonstration it has made of its usefulness and the wonderful possibilities it has opened to the entire lime industry for the future.

However, a belief does exist that a national association is not capable of taking care of the problem of intensive local promotional work. In other words, there is a strong home-rule element which desires to see the major part of the money it contributes spent in its own bailiwick for its own purposes.

That the Lime Association, to be true to the spirit of American institutions, should have a real representative form of government, anyone will readily concede. The election of its directors by vote of the convention has been rather perfunctory, and while the members chosen have truly represented the lime industry as a whole, they could hardly be considered as responsible representatives of the geographical districts from which they were tacitly chosen.

The first step then is to have the directors the chosen representatives of the district groups, and in this there appears to be a unanimity of opinion. The next question is, what will be the nature of the local organizations and what will be their relation and responsibility to the national organization?

There are some who would establish local district associations with managers and staffs responsible only to the local members, although the director or directors of one of these local associations would of course carry some of the responsibility for the activities of these locals to the board of directors of the national organization. It is claimed that this scheme of organization would permit intensive local promotional work of the particular kind desired by the group, and would induce new members to join who apparently will not join the national association as it now exists.

Such a policy is based on certain principles which will entirely change the character of the national associa-

tion. It is based on the assumption that settlement of local business problems is of greater importance than the raising of the standard of the business practices of the whole industry. It assumes that money spent in promoting lime on a national scale and on research work to develop new markets for lime is secondary to getting all the business in sight at the moment. It would certainly give very effective testimony to a want of confidence in the national organization and in one another of the members if they happen to do business a few hundred miles apart.

Carried out to its logical conclusion, such an organization would seem certain to end in rival groups of manufacturers—only one step removed from rival individual manufacturers, which is looked upon in every industry now as the cave-man stage of industrial progress. Logically carried out, the district bounds would be drawn to include all the markets of the group of manufacturers in the local organization. Obviously, this would be impossible. The result is that a manufacturer who sells over a wide territory would be called upon to support, in addition to a national association, a number of local organizations, in proportion to his tonnage sold in each district, no doubt, but he would probably be none too welcome in any and his funds for promotion would be scattered and dissipated instead of concentrated; so logically he would be justified in carrying out the home-rule principle on step farther by withdrawing from association work altogether and spending his promotional fund on his own organization.

The problem of harmonizing national and local association work to the greatest advantage of those who pay the bills is certainly no simple task, but it certainly never will be solved satisfactorily by any group of manufacturers until they have acquired a very broad and liberal point of view. The man with such a point of view considers his own individual business bettered, when his entire industry is raised a peg. That there are some who benefit along with him who have not shared the expense is a very fundamental human experience, and certainly ought not to deter any reason-



ing being from progressing another step.

The Lime Association is still an infant. It is only one year old. Yet it has given promise of being a most useful and necessary member of the society of American industries. Membership in it gives every promise of being the most profitable investment a lime manufacturer can make. But it is growing and needs sustenance. It needs encouragement and nursing. To

deny it these things is not only to sacrifice the greatest opportunity the lime industry ever had, but is to throw away many tens of thousands of dollars and invaluable brains and energy which have already been spent in getting thus far.

It is too soon to conclude that the Lime Association cannot handle local as well as national problems. It should be given a fair chance.

## Pennsylvania Crushed Stone Men Prove Value of an Active Association

Pursue Open-Hand Policy and Win Confidence of State Highway Authorities—Also Win Freight Rate Reductions

A MEETING of the Eastern Stone Producers' Association was held in Harrisburg, Pa., June 25. For the first time the members of the association brought in their cost sheets for comparison, as well as the sales prices.

The unit costs of the various plants were tabulated and were presented later in the day at a hearing with the State Highway Engineer. The data submitted also included average selling prices for the present season.

With the aid of these data the crushed stone men were able to convince the State Highway Engineer that the average profit per ton of stone sold this year did not exceed 8 cents.

The Pennsylvania State Legislature recently passed an act which will permit the State Highway Department to own and operate quarries for the production of road-building stone. According to the information given by the State Engineer at this meeting, there is no intention on the part of the Highway Department at this time to go into the quarry business, and it does not appear that the act was aimed at quarry men.

The meeting was a notable one in that it exemplifies the open-hand policy of this association. This action should go a long way to disillusion any who think there are enormous profits to be had in the crushed-stone industry under present conditions.

There is great activity among Pennsylvania quarries, as the road-building program has been begun there in earnest. A large part of the contracts let thus far are for concrete roads, for which the State Highway Department is insisting upon a crushed stone coarse aggregate.

In New Jersey just the opposite course is being pursued. There is extraordinary activity among the sand and gravel plants because practically all the concrete road work there is of gravel concrete.

### Win Freight Reduction

AFTER ABOUT SIX HEARINGS before freight traffic committees and by persistent efforts the Eastern Stone Producers' Association has won its contention that the rates ordered by the Interstate Commerce Commission in the famous Birdsboro Stone Co. case should be applied on all the lines of the Pennsylvania Railroad. It is now pending whether or not the same rates shall be extended to the lines of Philadelphia & Reading Railway.

A full discussion of the case will be found in ROCK PRODUCTS of September 11, 1918, and December 18, 1918. The contention of the association was that:

"An analysis of the decision of the I. C. C. reflects that a base rate of 20 cents per ton was used plus 6 cents per ton for each block of ten miles to short haul points, and same arbitrarily decreased for the longer hauls, and assuming that its decision is fair to all parties interested for the distances mentioned it is fair to assume that the same basic principle is applicable to distances for less than 50 miles, for which no provision was made by the I. C. C. This would make the following schedule":

		Plus 20c per ton increase June 25.
0 to 10 miles.....	\$0.26	\$0.46
11 to 20 miles.....	.32	.52
21 to 30 miles.....	.38	.58
31 to 40 miles.....	.44	.64
41 to 50 miles.....	.50	.70
51 to 60 miles.....	.56	.76
61 to 70 miles.....	.62	.82
71 to 80 miles.....	.68	.88
81 to 90 miles.....	.74	.94
91 to 100 miles.....	.80	1.00

These rates have now been made effective on the Pennsylvania Railroad for both interstate and intrastate commerce. All this was accomplished, it might be added, without the assistance of traffic

experts or paid legal talent, but merely by persistent pegging away on the part of the officers of the association.

### Employer Liable for Blow Struck in Quarrel

THE PENNSYLVANIA State Compensation Board has upheld compensation in the case of Graeber vs. North American Co., Philadelphia, wherein death was due to a blow struck in a quarrel between employees when one asked another to stand out of the light. The claimant in this case is held to be "in the same position as though she were claiming compensation for the death of her husband because of an injury suffered by him in the course of employment caused by a break in machinery."

### Pennsylvania State Highway Bonds Bring 3½ Per Cent Premium

TWENTY-THREE BIDS were received by State Treasurer Kephart and Auditor General Snyder of Pennsylvania for the \$12,000,000 worth of bonds of the \$50,000,000 road loan to be issued July 1. The issue is known as Series A, and is to be put out in blocks of \$2,000,000 at 4¼ per cent, maturing in five, ten, fifteen, twenty, twenty-five and thirty years, free from the personal property tax of the state and exempt from the normal and all surtaxes and excess profits taxes of the Federal income tax law.

Keen competition existed and the highest bid came from the Liberty National Bank, and Halsey, Stuart & Co., New York; Frazier & Co. and Biddle & Henry, Philadelphia, and Holmes, Bulkley & Wardrop, Pittsburgh, bidding jointly and for the entire issue, \$12,423,540, or an average rate of 103.529.

# First Annual Meeting of Lime Association

Manufacturers of Over 80 Per Cent of the United States Lime Production Registered at Pittsburgh Convention—Great Possibilities for Future of the Lime Industry Are Shown

**T**HE PROMISE OF EXHIBITING some remarkable developments in the lime industry was amply lived up to at the first annual convention of the Lime Association held in Pittsburgh, Pa., June 18 and 19. Both as a promotional and as a research organization much has certainly been accomplished in the past year by the staff of the Association.

The research department, under Allen D. Whipple, has opened up the prospects of an entirely new field for the use of lime, which may possibly make it a competitor of Portland cement. For Mr. Whipple has succeeded in casting blocks and slabs of **lime concrete**, which apparently will serve many if not all the purposes of Portland cement concrete.

By the addition of an "accelerator" to hydrated lime a cement has been produced which has the property of setting rapidly and of forming an apparently excellent concrete within a period of a few days. The use of the same accelerator, the nature of which has not been divulged, the Lime Association laboratory has been enabled to produce a quick-hardening wall plaster, hollow building blocks, and other structural necessities in fields which have heretofore never been entered by lime.

## Exhibits of Lime Concrete

Probably the most interesting exhibit was a reinforced lime-concrete slab 6 ft. long by 15 in. wide and 9 in. thick. This slab was cast in the Washington laboratory of the Association six days previous to the Pittsburgh meeting. The forms were removed within 24 hours after the concrete was poured. It was then crated and shipped by express from Washington to Pittsburgh, where it arrived without any evidence whatsoever of structural weakness resulting from rough handling. After the convention, when the slab was eight days old its strength was tested by as many men as could stand upon it, without the material showing any faults.

Mr. Whipple also exhibited 4-in. blocks of lime mortar, only six days old, which had apparently set through the entire thickness of the blocks. He also exhibited a panel of plaster, the scratch coat of which had been put on at noon and the brown coat at 5:30 p. m. the same day, stating that a finish coat could have been added in from 24 to 48 hours.

The composition of this plaster was stated to be the standard mix for brown coat lime plaster, 350 lbs. of sand to 100

**Keep the Lime Kilns  
Burning**  
Keep the lime kilns burning,  
Keep the crushers churning;  
You'll need all your tonnage in  
the days at hand.  
Big demands are coming,  
Soon they will be humming  
When the masons yell for lime  
throughout the land.  
—Convention Song.

lbs. of hydrate, with the addition of 10 lbs. of "accelerator." As to the nature of the "accelerator," Mr. Whipple said this was not a rare material, but was something that would be available to every lime manufacturer. In answer to a question he stated that it could be used equally well with high calcium and magnesium limes. The additional cost might be only 30 to 40 cents per ton of hydrate.

Patents have already been applied for which will cover the use of this material and the process; and the opportunity is before the Lime Association to acquire proprietary rights for its use. It is probable that the Association will acquire such rights and license the use of the process and material to members of the Association only, in accordance with the resolution adopted by the convention.

## Steel Barrels for Shipping Lime

Aside from the exhibits of lime products probably the things which attracted the most interest and comment were some steel drums or barrels for shipments of caustic lime. The great growth of the chemical lime industry has clearly demonstrated the need of making shipments in such a manner as to prevent the deterioration of the lime in transit. Nearly all the chemical industries which use lime want as nearly pure calcium oxide as it is possible to obtain. The recarbonated or air-slaked product is not only a useless impurity but in many instances positively interferes with the function the lime is designed to perform.

At least one lime producer, the Oro Grande Lime & Stone Co., Los Angeles, Calif., has been using steel containers for lime shipments for a considerable time. One of this company's containers, 17½ in. in diameter by 25 in. high, made of 28-gage steel sheets, was exhibited at the convention. This container held 180

lbs. of lump lime. It is filled and emptied through a 6-in. hole in the head. The flanged cap is simply pressed into the opening and sealed with a paint or daub coat of roofing material or asphalt.

The lime is put into the barrel red hot, the edge of the friction cap is swabbed with roof paint and this cap forced into the opening. A small tool made for this particular purpose is used to push three points equidistant from the circumference of the cap so as not to puncture the metal and does not protrude below the turned edge of the opening in the head.

Experiments indicate that this steel package will hold lime in satisfactory condition without slaking for two years and with no deterioration whatsoever.

The cost of these containers as produced by a local (Los Angeles) manufacturer was stated to be 84 cents each in lots of 20,000 to 25,000. The seam of each barrel is spot welded at three points and each barrel has two double ribs or corrugations near the heads. It was stated that such barrels were strong enough to stand an average of five trips. The purchaser of the lime is charged 25 to 30 cents for the barrel, but is allowed 25 cents credit for its return, the purchaser paying the return freight.

At the present cost of wood barrels, which on the Pacific coast was stated to be from 70 to 80 cents apiece, it has been demonstrated that here is considerable economy in the use of the steel container. Moreover, the steel container weighs only 8 lbs. against the 14 lbs. of a wood barrel. Henry Angel, of the Kelley Island Lime and Transport Co., Cleveland, Ohio, said a similar barrel could be obtained of a Cleveland manufacturer in car-load lots for 70 cents each, f. o. b. Cleveland.

The principal discussion on steel barrels focused on the point of whether or not a returnable container was desirable. A number of lime producers are evidently of the opinion that the return of the container involves too much red tape to make it worth while, although the west coast manufacturer who has tried it out recommends the scheme very highly.

A number of lime manufacturers also believe that some kind of collapsible barrel is the proper thing, as this would enable much larger shipments of empty barrels at the same cost. Experience in handling other chemicals, it was stated, gives good reason to believe that such a







development in the lime industry is easily within the range of possibilities.

In any event it is apparent that a comparatively air-tight container will soon be demanded by the purchasers of chemical lime. Mr. Whipple aptly compared the attempt to ship caustic lime to chemical works in bulk and in wood barrels to an attempt to carry water in a leaky pail. The remarkable feature of the whole question is that it was not until the Lime Association took the matter up that lime manufacturers have shown much of any interest in the matter.

#### Big Future for Agricultural Lime

Great emphasis was laid on the future possibilities of agricultural lime, both by President Carson and by Prof. Elmer O. Fippin, who has recently joined the staff of the Association as head of the Agricultural Lime Department. Prof. Fippin said a conservative estimate of the amount of agricultural lime actually needed in the territory east of the Mississippi river was 23,000,000 tons annually.

For helping the lime industry attain this tonnage the laboratory of the Association has already made an important contribution in the way of a soil-testing apparatus, which shows approximately by means of colored liquids the amount of lime required to neutralize acid soils. The apparatus is very simple, consisting only of two graduated glass tubes, and the two necessary liquids, and can be used in the field by a lime or fertilizer salesman. Of course it does not give the amount of lime to use for various crops, but it will furnish visible proof of the necessity of a certain amount of lime to overcome soil acidity, which is the first step in the program.

In his discussion of the needs of the Agricultural Department of the Association, Prof. Fippin laid emphasis on the difference in the meaning of the word **lime** in industry and in agriculture. In agriculture he said it had come to mean all forms of the material—limestone, hydrate and caustic lime. He said it would be practically impossible to eliminate this broad use of the term, whether lime manufacturers liked it or not.

Prof. Fippin said there was a splendid opportunity to do away with any further antagonism between fertilizer and lime manufacturers, because the fertilizer men were getting nearer the point where they were compelled to recognize the necessity of using lime with all their fertilizers and consequently were voluntarily trying to get a better understanding of the use of lime. He said the recent gathering of fertilizer sales managers at Cornell University (referred to in **Rock Products**, June 21, p. 26) was an example of the progress being made and of the opportunity afforded in bringing about close working relations with the

commercial fertilizer industry. Some fertilizer manufacturers have already expressed a desire to handle agricultural lime as a side line.

Prof. Fippin outlined in detail a program of publicity and co-operation with state experimental stations, the agricultural colleges and the national department of agriculture, which if followed out will probably go a long way toward developing the 23,000,000-ton annual production.

Supplementing Prof. Fippin's talk, Henry M. Camp, head of the agricultural lime bureau, maintained by the eastern district lime manufacturers, gave a resume of the work of that bureau since its organization. The activities of this bureau are devoted to the promotion of



Robert F. Hall, General Manager

lime and hydrate as in competition with ground limestone. Much progress has been made in this work by working out a **cost per unit of calcium oxide applied to the soil**. By the use of such an argument it is possible to convince many farmers of the ultimate economy of lime as against ground limestone. Mr. Camp said, however, that the problems of the eastern district were to some extent peculiar and required special treatment.

#### Activities of Chemical Bureau

A good deal has already been said about the activities of the chemical laboratory under Allen D. Whipple, but in addition the following program was outlined for the future: The preparation of bulletins, for use of Association members only, on the use of lime in sewage purification and garbage disposal; water purification and softening; the tanning

industry, in co-operation with the American Leather Research Laboratory, New York City; the rubber industry; the pulp and paper industry; in sanitation; the paint and varnish industry.

To follow these things to the greatest advantage Mr. Whipple believes in the closest possible co-operation with the interested industries. By personal inspection of plants and processes he believes much new and valuable matter on the use of lime will be developed. He mentioned the recent discovery that the use of lime with the cheaper resins gave a varnish equal to that made from the most expensive resins, as showing not only the infinite number of uses for lime but to prove that the field had hardly been explored.

Mr. Whipple pointed out that this work could not of course be expected to yield immediate results. The product of such research work was the development of a large number of small increases in tonnage, which, however, in the aggregate would amount to a great deal. To carry out this work as it should be carried out, Mr. Whipple needs assistants and a library.

#### Construction Bureau Active

Both the president and the general manager of the Lime Association were emphatic in stating the obligations of the Lime Association to the former Hydrated Lime Bureau, now the Construction Bureau of the Association. Under its chief, Norman G. Hough, this has done a wealth of pioneer work in promoting the use of hydrated lime and more than any other activity of the old Lime Manufacturers' Association its work contributed to the prestige of the lime industry. Since the formation of the Lime Association Mr. Hough's bureau has done much in the promotion of lump lime and plaster as well as hydrate.

Mr. Hough said he was sure we were facing a great building boom and that an advertising campaign to reach not only engineers and architects but the building public was a necessity if the Association were to cash in on the very valuable pioneer work already accomplished.

#### Advertising Lime

To bring before lime manufacturers what other industries were doing in the way of advertising, H. L. Staples, advertising expert, Richmond, Va., presented a paper on "A Plan for Association Advertising." Mr. Staples said that such trade associations as those promoting cement, fertilizer, lumber and automobiles spent from 1 to 10 per cent of the annual sales receipts for advertising. He dealt more specifically with the splendid possibilities in the advertising of agricultural lime and suggested an advertising campaign to cost 3 cents per ton on the present tonnage of the Association, which would reach 2,000,000 farmers.

Mr. Staples gave much interesting information based on a very extensive advertising experience. Among other things he said that advertising in the highest class publications in the field to be reached invariably gave much larger returns than advertising in second-rate periodicals. He depreciated the local county newspapers as advertising mediums for agricultural lime, stating that the page was too large, that all the interest was concentrated on local news, and that its life as an advertising medium was short.

#### Annual Banquet

The first annual banquet of the Lime Association was an event long to be remembered for its gayety and enthusiasm without the assistance of alcoholic stimulant. However, stimulation was furnished liberally in the way of song hits, some of which appear herewith, from the pen of the Association's general manager, Robert F. Hall.

The principal after-dinner speeches were made by Dr. C. C. Fletcher of the Bureau of Soils, U. S. Department of Agriculture, and Bob Leeds, a professional story-teller of Birmingham, Pa. President Carson and Charles Warner gave some amusing and instructive reminiscences of the early days of the National Lime Manufacturers' Association.

The banquet was also made the occasion of presenting a beautiful watch to President Carson as a token of the appreciation of the members of the Association for the unselfish and untiring efforts he has put forth to make the Association what it is today. The presentation was made by Col. C. W. S. Cobb, of the Glencoe Lime & Cement Co., St. Louis, dean of the American lime industry.

#### Election of Officers

Very much and very persistent persuasion was necessary to induce President Carson to accept the office again. He has already served fourteen years as the leader of the lime industry and during the last year or two has given gratis at least a third of his time and energies to exclusively Association work. He was finally persuaded to continue his services for another term. All the other officers of the Association were also unanimously re-elected as follows:

President, William E. Carson, president of the Riverton Lime Co., Riverton, Va.; treasurer, Col. C. W. S. Cobb, president of the Glencoe Lime & Cement Co., St. Louis, Mo.; secretary and general manager, Robert F. Hall, Washington, D. C. The directors re-elected were: George B. Wood, president of the Rockland & Rockport Lime Co., Rockland, Me.; Charles Warner, president of the Charles Warner Co., Wilmington, Del.; J. L. Durnell, manager of the Knickerbocker Lime Co., Philadelphia, Pa.; Wm.

J. Grove, president of the M. J. Grove Lime Co., Lime Kiln, Md.; J. King McLanahan, Jr., secretary and treasurer of the American Lime & Stone Co., Hollidaysburg, Pa.; Warner Moore, secretary and treasurer of the Moore Lime Co.,

### A History-Making Resolution

**RESOLVED**, That any new basic process relating to any department of the lime business which has been perfected by the organization of the Lime Association, or by any of its employees, shall be fully covered by United States patents in the name of the inventor, and the sole right to the use of such patents shall be transmitted, under license, by the inventor to the Lime Association.

The Lime Association shall grant the use of such patents only to companies engaged in the manufacture of lime and only to such companies as are members in good standing of the Lime Association, with dues paid from the inception of the Lime Association, July, 1918.

It shall be particularly stated in the license that the right to the use of the process under such license, shall maintain only in the event of the licensee continuing a member of the Lime Association in good standing with dues paid.

Under the terms of the license, the Lime Association will receive from the licensee, a royalty per ton or per unit manufactured by the licensee, the amount of such royalty in all cases, to be determined by vote of the Board of Directors of the Lime Association.

The monies so received as royalty shall be divided into three portions in accordance with the judgment of the Board of Directors. One portion of such money shall be paid by the Lime Association to the inventor, the second portion shall be used by the Lime Association for promotional work or advertising to promote the sale of the product yielding the revenue, the third portion shall revert to the Treasury of the Lime Association for general use in accordance with the judgment of the Board of Directors.

Richmond, Va.; B. Gager, president of the Gager Lime & Manufacturing Co., Chattanooga, Tenn.; A. H. Lauman, president of the National Mortar & Supply Co., Pittsburgh, Pa.; Henry Angel, general sales manager, Kelley Island Lime & Transport Co., Cleveland, Ohio;

J. J. Urschel, president of the Woodville Lime Products Co., Toledo, Ohio; B. L. McNulty, general manager of the Mitchell Lime Co., Mitchell, Ind.; G. J. Nicholson, Jr., president of the White Marble Lime Co., Manistique, Mich.; J. F. Pollack, general auditor of the Ash Grove Lime & Portland Cement Co., Kansas City, Mo., and Charles Weiler, vice-president of the Union Lime Co., Milwaukee, Wis.

The following committees were appointed:

**Committee on Trade Practices**—Bernard L. McNulty, general manager, Mitchell Lime Co., Chicago, Ill., chairman; Robert F. Hall, general manager, Lime Association, Washington, D. C., secretary; C. C. Bye, general manager, Charles Warner Co., Wilmington, Del.; Morgan Curtis, president, Northern Lime and Stone Co., Petoskey, Mich.; J. L. Durnell, sales manager, Knickerbocker Lime Co., Philadelphia, Pa.; J. M. Gager, vice-president and secretary, Gager Lime and Manufacturing Co., Chattanooga, Tenn.; A. N. Griffing, vice-president, New England Lime Co., Danbury, Conn.; A. H. Lauman, president, National Mortar and Supply Co., Pittsburgh, Pa.; B. F. Pay, Fowler and Pay, Mankato, Minn.; J. F. Pollock, secretary, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.; H. J. Russell, president, F. W. Wait Lime Co., Glens Falls, N. Y.; H. B. Warner, sales manager, Security Cement and Lime Co., Hagerstown, Md.; Gordon Willis, vice-president and secretary, Peerless White Lime Co., St. Louis, Mo.

Practically all questions concerning quotations, contracts of sale, analyses at destination, protection against decline in prices, uniform cash discount, sales for future delivery, and numerous other knotty problems will be handled by the Trade Practices Committee.

**Committee on Credits and Collections**—Col. C. W. S. Cobb, president, Glencoe Lime and Cement Co., St. Louis, Mo., chairman; Norman G. Hough, director of the construction, Lime Association, Washington, D. C., secretary; Moses Bigelow, secretary and treasurer, Palmer Lime and Cement Co., New York, N. Y.; F. C. Cheney, general manager, Cheney Lime Co., Allgood, Ala.; H. A. Gawthrop, president, Merion Lime and Stone Co., Norristown, Pa.; G. J. Nicholson, secretary, White Marble Lime Co., Manistique, Mich.

**Committee on Uniform Cost Accounting**—A. D. Warner, vice-president, Charles Warner Co., Wilmington, Del., chairman; Robert F. Hall, general manager, Lime Association, Washington, D. C., secretary; W. P. Sabin, general auditor and assistant to president, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.; A. A. Wilson, Mitchell Lime Co., Chicago, Ill.



**Committee on Statistics**—Charles Warner, president, Charles Warner Co., Wilmington, Del., chairman; Robert F. Hall, general manager, Lime Association, Washington, D. C., secretary; Chas. R. Leo, general manager, Palmer Lime and Cement Co., New York, N. Y.; A. Courchesne, El Paso, Texas; G. H. Faist, salesmanager, Woodville Lime Products Co., Toledo, O.; B. B. Williams, Marblehead Lime Co., Chicago, Ill.

The function of this committee is to determine the best use to be made of the statistics now being gathered from the industry on the production and distribution of their products, and such other information as may from time to time be found necessary and desirable for the general benefit of all the manufacturers.

As soon as all companies have submitted their tonnage reports, this committee will analyze the results and determine the form in which the information can best be returned to the industry. The

work of this committee will furnish the best possible index for future activities of the Association with a view to securing immediate tonnage where most needed.

**Committee on Accident Prevention and Insurance**—M. M. Hunter, sales manager, Clinchfield Portland Cement Corp., Kingsport, Tenn., chairman; A. D. Whipple, chief engineer and director of the chemical bureau, Lime Association, Washington, D. C., secretary; T. P. Black, Black White Lime Co., Quincy, Ill.; J. D. Hartman, manager, Calcium Products Co., Hollidaysburg, Pa.; F. A. Jones, secretary and manager of operations, Kelley Island Lime and Transport Co., Cleveland, Ohio; J. J. Urschel, general manager, Woodville Lime Products Co., Toledo, Ohio.

#### Leave Future of Association in Some Doubt

No action was taken at the Pittsburgh convention looking to the expansion of

the activities of the Association as asked for by the president and staff of the organization. The membership voted to continue on the same basis as at present, namely a yearly assessment of 4 cents per ton of lime produced, until October 1, when there will be another meeting of the Association to act upon a new plan of organization to be worked out by the board of directors before that time.

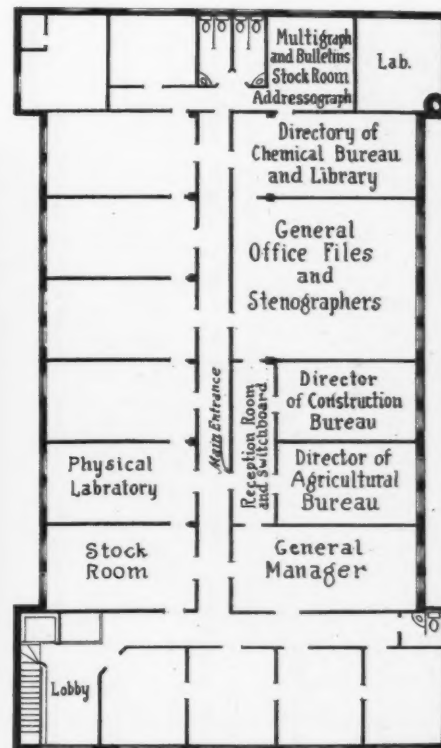
#### THE PROFIT ON LIME

(Tune—"Ninety-Nine Blue Bottles")  
There was not a cent of profit in a barrel full of lime  
There was not a cent of profit in a barrel full of lime  
There are men whom we could mention who considered it a crime  
That here wasn't any profit in a barrel full of lime.  
  
There was not a cent of profit in a barrel full of lime  
There was not a cent of profit in a barrel full of lime  
But Carson thought he'd fix it if he had a little time  
So there'd be a little profit in a barrel full of lime.  
  
There was not a cent of profit in a barrel full of lime  
There was not a cent of profit in a barrel full of lime  
The Cost Accountants gathered round from almost every clime  
And they put a little profit in a barrel full of lime.  
  
There was not a cent of profit in a barrel full of lime  
There was not a cent of profit in a barrel full of lime  
But old Depletion stuck his head above the dust and grime  
And pointed out a profit in a barrel full of lime.  
  
There ought to be a profit in a barrel full of lime  
There ought to be a profit in a barrel full of lime  
For everyone is willing and our lives will be in rhyme  
When we get a little profit from a barrel full of lime.

—A convention song hit.

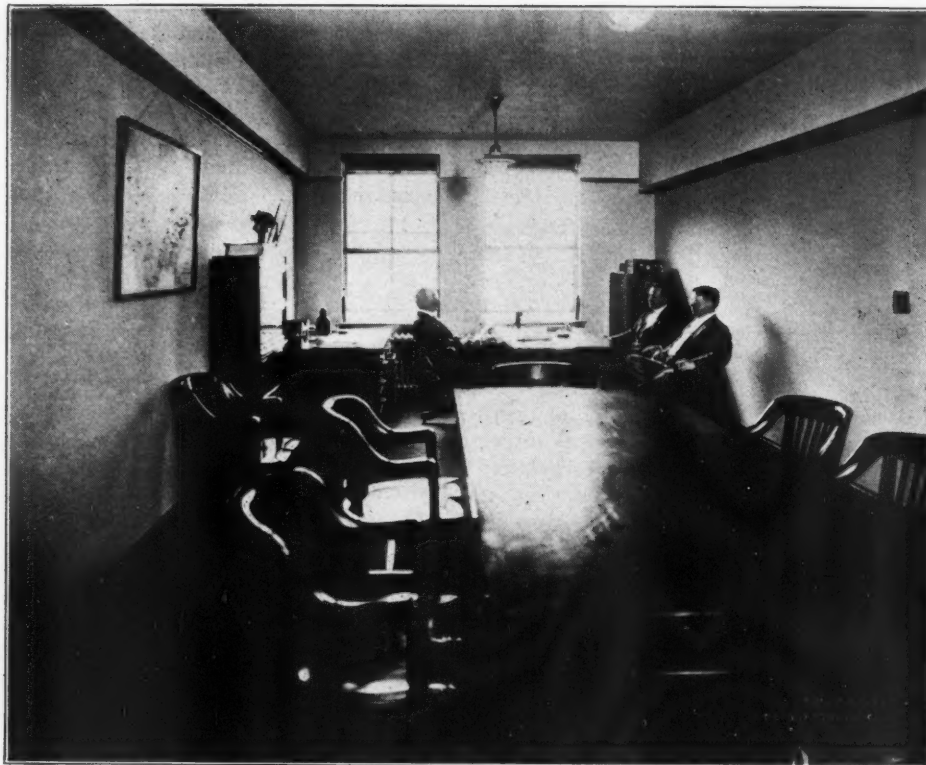


Washington, D. C., headquarters of the Lime Association—On fifth floor



Floor plan of the Lime Association headquarters

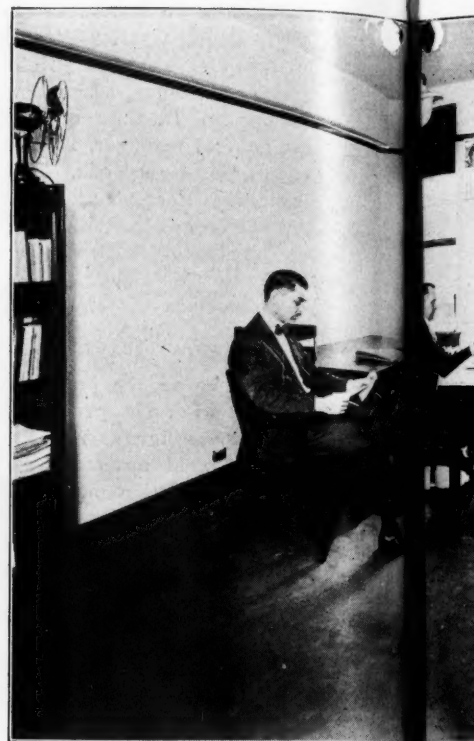




Office of General Manager Hall—where Executive Committee meets and “backs him in a corner”

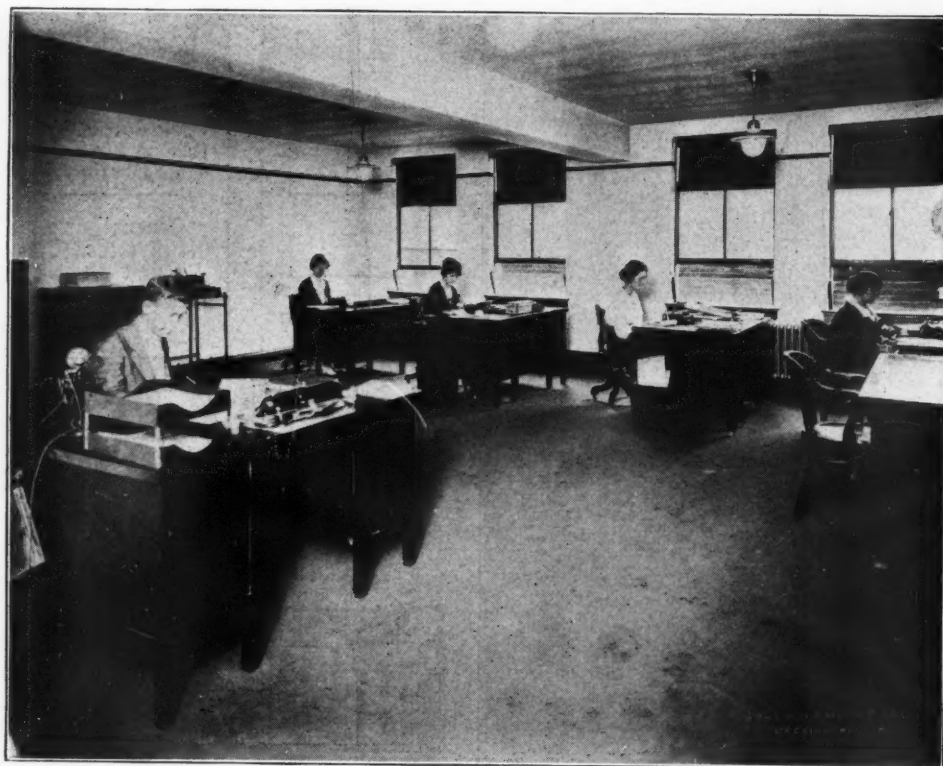
We have a busy bunch of boys at Washington,  
D. C.  
They stir up lots of grief for us and grin with  
ghoulish glee.  
They pester us with letters every week that make  
us laugh  
And yet we tip our lid to the Association Staff.

Carson, Wood, McLanahan, McNulty, Angel,  
Warner,  
Like to back the General Manager into a corner.  
They sit around the table and they smoke their  
big Cheroots—  
The Executive Committee and it really executes.

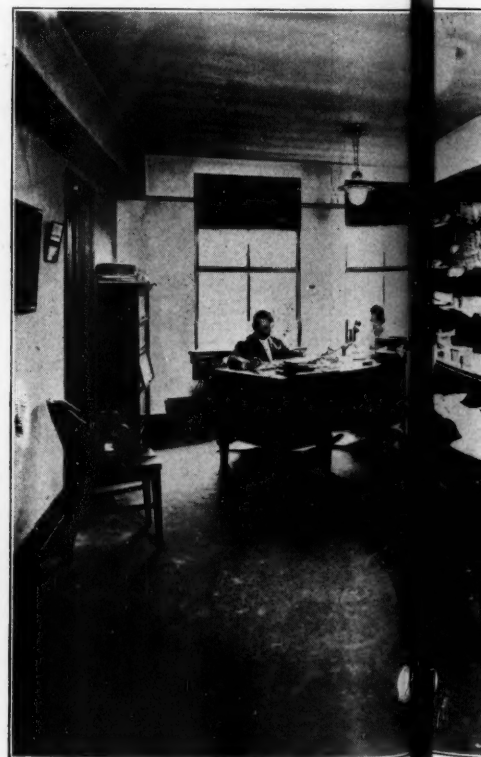


Norman G. Hough—Chief of the Consulting Bureau—right

In Fippin's head we're sure there is of knowledge  
quite a load,  
He raises lovely carrots on a brand new concrete  
road.  
He ought to have a medal and of glory a big gob.  
If he can grow some hair upon the head of  
Colonel Cobb.



General office for stenographers and typists who “help the general manager bear his load”



Mr. Whipple's office and the beginning—when his come t



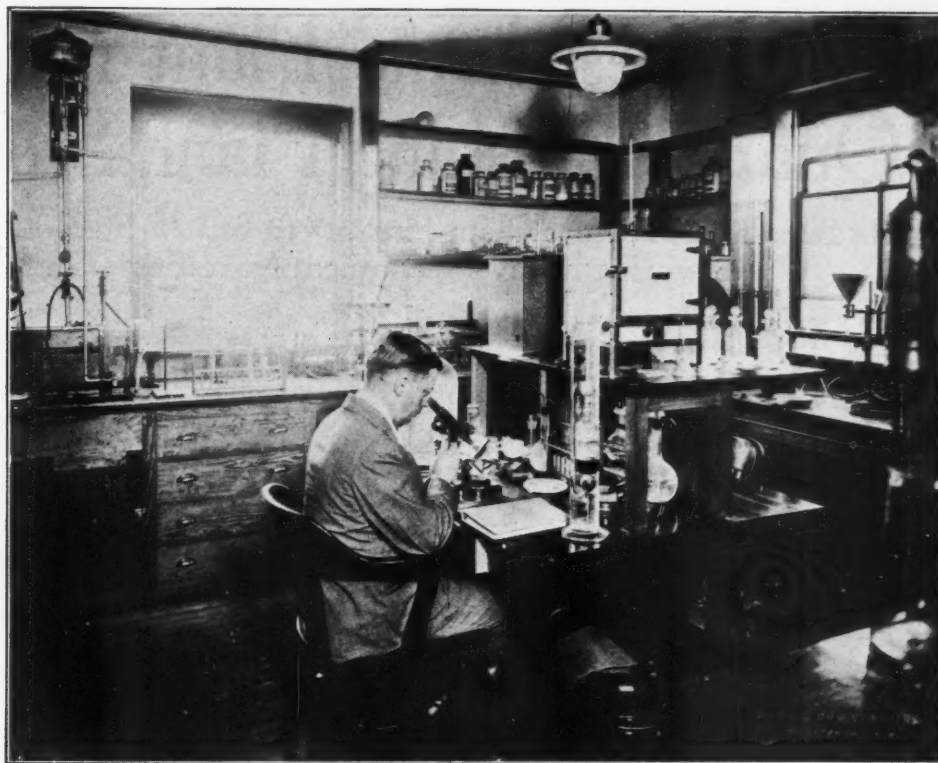
the Consulting Bureau—Prof. Fippin will have adjoining office right

knowledge  
concrete  
big gob,  
lead of

It doesn't mean a thing that Hough's initials are N. G. The work he does from day to day is marvelous to see. He's putting lime on all the walls and into concrete, too. Just keep your eye on Hough and see the things that he will do.



beginning most complete lime library in the world when his come true



Allen D. Whipple in his laboratory hatching a nestful of new uses for lime in all the industries

The laboratory does some things mysterious and queer. It's run by Mr. Whipple whom we call Chief Engineer. He's making hard wall plaster and he's reinforcing lime. And notwithstanding dust and dirt he's smiling all the time.

The field men and the girls and clerks and e'en the office boy Are on the job and do their work with not a little joy. They back the General Manager, they help him bear his load. With such a bunch we're sure to travel far along the road.



The mailing room where the weekly bulletins are printed and addressed to the lime industry



# The Largest Lime Plant in the World— Quarry, Crushing Plant, Stone Storage

Muscle Shoals Air Nitrate Plant Has Seven 8x125-Ft. Rotary Kilns—Second Article  
Will Describe Many Mechanical Novelties—Operating Experience

AT MUSCLE SHOALS, ALA., on the Tennessee River, is the largest rotary-kiln lime plant in the world; yet little has been written of it, and previous to this article no complete description of the plant has appeared in print. This remarkable lime plant was built by the United States Government as a part of its air nitrates plant No. 2 and was to have been operated by the Air Nitrates Corporation, a subsidiary of the American Cyanamid Co., which introduced the manufacture of air nitrates into this country and has operated a cyanamid plant at Niagara Falls, Ont., since 1909, and an ammonia plant at Warners, N. J., since 1916.

The circumstances which led to the building of the Muscle Shoals plant were these: The limiting factor in the production of ammunition was the supply of nitrates available for explosives manufacture. The 9,000,000 tons of ammunition used by the Allies in the first four

years of the war consisted of about 6,000,000 tons of metal and 3,000,000 tons of chemical explosive. Three-fourths of this supply of chemicals has been made from a raw material, nitrate of soda, obtainable only in Chile, on the west coast of South America, over 4,000 miles from New York, via the Panama Canal, and over 8,000 miles from England or France. In 1917 over one million tons of nitrate was used for explosives in the United States alone, while about three-fourths of a million tons was used in France and England. Considering the shortage of shipping, the dangers of submarine blockades, and the possibility of slides in the canal, making necessary a great lengthening of the routes around the southern end of South America, it can be easily appreciated that this source of supply was a great menace and burden to the allied cause.

In fact, one of the first acts of the German Navy, after the outbreak of the

war, was to send a squadron of cruisers, under Admiral von Spee, to the west coast of South America in order to break up the nitrate traffic. Fortunately, the British Navy promptly removed this danger by sinking the German squadron off the Falkland Islands.

Even after the nitrate had been received in the United States it was still far from being an explosive. It must first be converted to nitric acid by the use of sulphuric acid, which in turn is made from pyrites brought from Spain through the submarine zone. Every ton of nitrate requires one and one-half tons of sulphuric acid to convert it to nitric acid. The nitric acid then has to be fixed with a base, and here there was more trouble. The supply of suitable bases for making high explosives was wholly inadequate.

Three different bases were being utilized—toluol, which makes tri-nitro-toluol, or TNT.; phenol, which makes pic-



Rockwood quarries, Tennessee, where limestone for nitrates plant was quarried



ric acid; and ammonia, which makes ammonium nitrate. These forms of high explosives are used solely as the bursting charge in the shells. For propelling the projectiles about an equal quantity of nitrated cotton is used. The latter is not powerful enough for use in shells.

Ammonium nitrate is the ideal explosive. By itself, it is harmless; it will not burn and it will not explode by concussion. If, however, it is mixed with about 20% TNT, the mixture becomes even more powerful than TNT. The only trouble with ammonium nitrate has been that not enough of it could be obtained. Its production has been limited by the amount of ammonia available.

Until recently the only source of ammonia in this country was the by-product coke ovens. In spite of the best efforts of the coke oven operators, their production of ammonia has just about reached a maximum, namely, about 100,000 tons of ammonia per annum. Coke ovens are constructed primarily to make coke; the ammonia is merely a by-

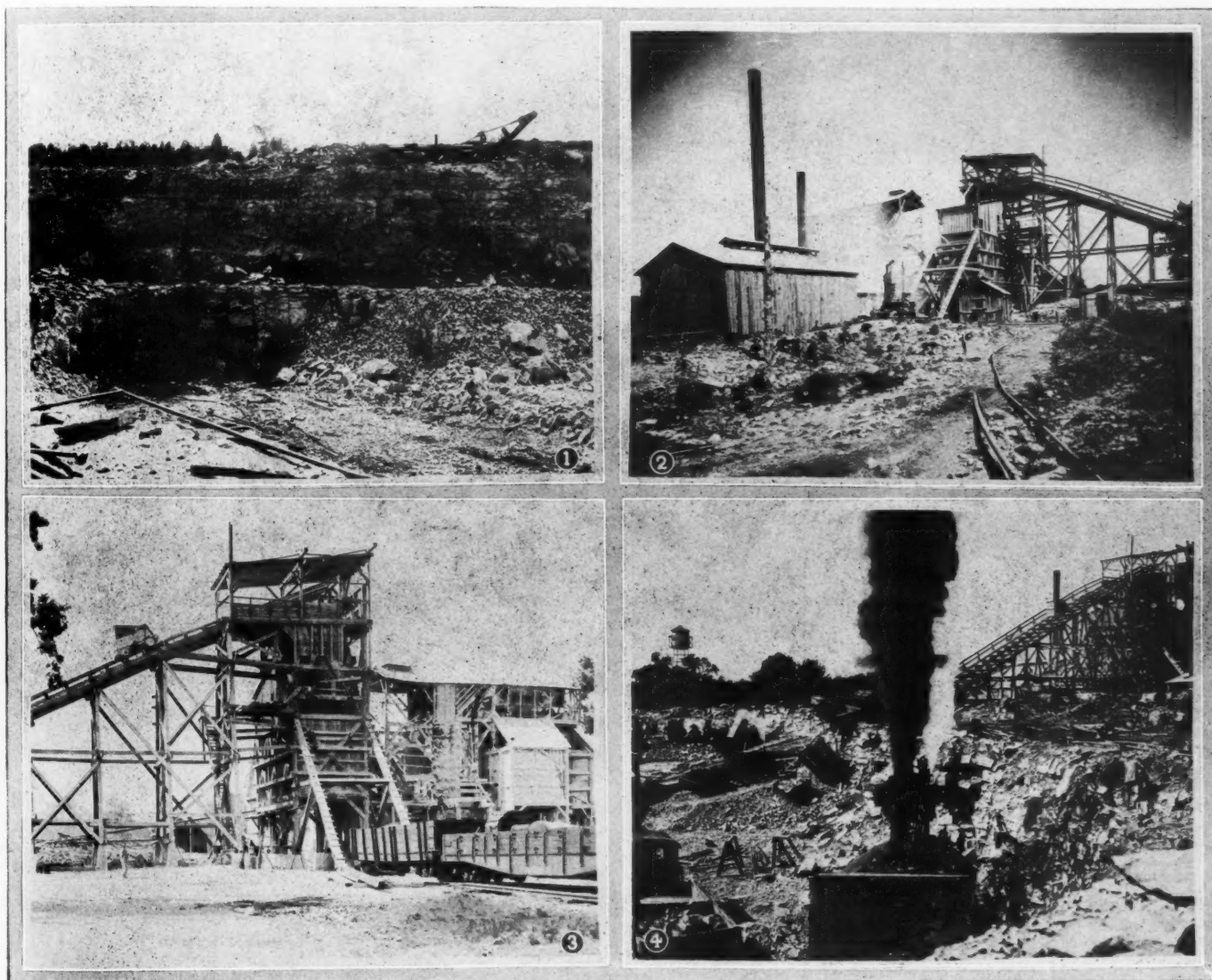
product, amounting to about 5 lbs. per ton of coal, or 1 lb. of ammonia to 400 lbs. of coal coked. Under the stimulus of prices for ammonia, about double the ordinary price, and prices for other by-products as much as ten times the normal prices, the capacity of the by-product coke ovens about doubled after the outbreak of the war.

At the outbreak of the war interest in the establishment of an air nitrates industry in this country received a considerable impetus. The newspapers, the scientific press and engineering publications were almost universally in favor of an immediate revision of the restrictive water-power laws. Instead, however, of modifying the restrictions that had kept private capital from founding an air-nitrates industry in the United States, Congress, in June, 1916, passed a bill appropriating \$20,000,000 for the establishment of a Government air nitrates plant. Notwithstanding the fact that the war had already been going on for nearly two years, and there was no telling when the

United States might be forced in, it is noteworthy that it was the demand for agricultural fertilizers that carried the bill, which, as a military measure alone, would probably not have passed.

A committee was appointed, which was succeeded a few months later by another committee, to study and report on "the best, cheapest and most available means for the production of nitrates and other products for munitions of war and useful in the manufacture of fertilizers and other useful products, by water power or any other power." The President was authorized to select a site or sites and manufacture nitrates by the process chosen. In April, 1917, the United States declared war on Germany. On September 6, 1917, one year and three months after the first committee was appointed, the Nitrates Supply Committee rendered its report.

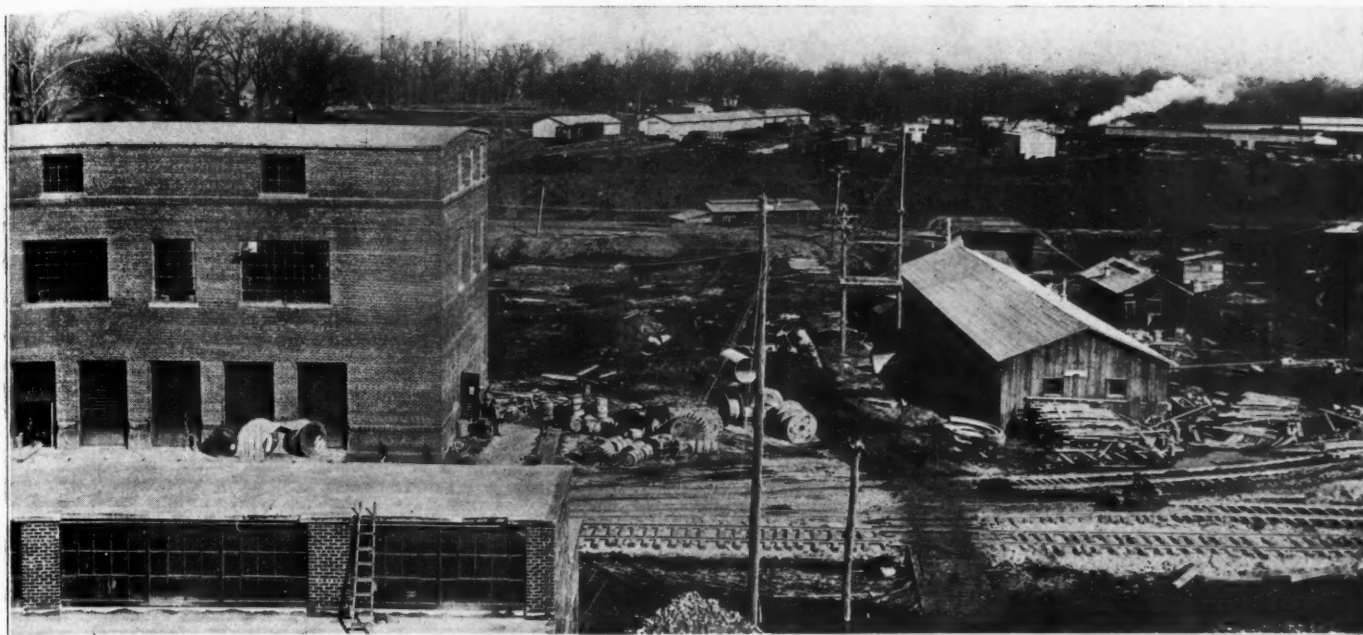
A few weeks after this report was rendered the War Department received a terrible shock. Somebody had figured out how much nitrate would be required



(1) Quarry view; (2) Crushing plant—this is the old plant which was to have been replaced; (3) Loading end of crusher plant; (4) Crushing plant from the quarry







Above, raw material storage, end of coal-pulverizer house, from top of electric furnace house... At right, track hoppers, elevator to limestone bins, and kiln feed bins

tion burden upon the already congested railroads. In addition, whatever solution of the problem could be found would have to stand the test of absolute dependability, for in the matter of supplying armies with ammunition uncertainty or doubt must not exist.

These were the same problems that our Allies, England, France and Italy, had to solve. There was but one answer—air nitrates.

The cyanamid process was chosen as best adapted to the needs of the situation. The electric arc process used in Norway required too much electric power. The Haber process, used only in Germany, was so intricate that it offered insuperable construction and operating difficulties. The General Chemical Co.'s modified Haber process had not yet passed from the experimental to the commercial scale, and therefore was not perfectly dependable. The cyanamid process had been in continuous operation at Niagara Falls, in Canada, since 1909. Cyanamid is the product made by absorbing nitrogen of the air in powdered carbide at a white heat. The nitrogen is obtained by distilling liquid air. The carbide is made by fusing together lime and coke in an electric furnace.

While the principal use of cyanamid, until a few years ago, was as a fertilizer, a considerable tonnage had been for several years converted to ammonia for the manufacture of ammonium nitrate, the



No. 1079  
LIME KILN BUILDING  
SHOWING ELEVATOR  
U.S. NITRATE PLANT NO. 2  
MUSCLE SHOALS ALA.  
3-8-19



explosive that the War Department particularly needed. A plant for oxidizing ammonia to nitric acid had also been in continuous operation for over a year. The cyanamid processes, therefore, covered every step from the fixation of nitrogen to the turning out of the finished explosive, ammonium nitrate.

In November, 1917, a corporation was formed at the request of the Government, to be known as the Air Nitrates Corporation, to construct and operate, as agent of the Government, an air-nitrates plant at Muscle Shoals, Ala., to produce 110,000 tons of ammonium nitrate per annum by the cyanamid processes. The ground for this big plant was broken in February, 1918. Over 22,000 men were employed on the construction, while about one-third that number would be required for operation. The plant started producing in the latter part of October, 1918. The cost is estimated at about \$57,000,000.

#### Lime Manufacture First Step

From the foregoing summary it is seen that quick-lime is one of the two essentials in making ammonia from the atmosphere. Consequently, a lime plant was the first manufacturing unit of the Muscle Shoals air nitrates plant.

The limestone was to have been purchased originally, but the Government ultimately took over the operation of the quarry and a complete new crushing plant was designed. The photographic illustrations accompanying this article show the quarry as it was operated. The accompanying plans show the crushing plant which was designed for this quarry, but not erected as yet, owing to the cessation of operation of the nitrates plant last winter.

The quarry is at Rockwood, Tenn., about 40 miles by rail from the lime plant. The rock is a high calcium limestone. It was crushed to 2½-in. size and down and brought to the lime plant

in standard railway equipment. In the old crushing plant there were few features of interest. It was able to turn out about 1,000 tons of stone a day.

The details of the proposed new plant are fully shown in accompanying plans and require little explanation. The most interesting feature, of course, is the use of Edison rolls. This plant was designed by the engineering department of the American Cyanamid Company.

#### Plant for 500 Tons of Lime a Day

The raw materials for producing lime—crushed limestone and coal—are brought to the plant by rail on opposite sides of the kiln building. The limestone was either stocked in large ground storage piles and rehandled by locomotive cranes and the plant railway, or was brought direct to reinforced concrete bins or track hoppers, from which the stone is fed to a belt conveyor in a concrete tunnel and then to a pair of elevators which take it to elevated reinforced concrete storage bins at the stone feed ends of the kilns.

These concrete bins form a single structure divided into seven compartments, one for each kiln. The crushed stone as it comes from the track hoppers by elevator is discharged to a shuttle conveyor, shown in the accompanying illustration, which deposits the stone in any one of the seven compartments.

A succeeding article will describe the rotary-kiln plant in detail, including a very complete and interesting pulverized-coal unit for firing the kilns. Also there will be given the results of the operating experience with this huge plant.

#### National Agricultural Limestone Association Meets

A MEETING of the National Agricultural Limestone Association was held in Columbus, Ohio, June 24. The matter of advertising was thoroughly discussed but no general advertising policy was agreed upon. C. R. Wagner, field lecturer, reported that a local limestone crusher in Montgomery County, Ohio, had gone to grief financially and was compelled to raise price of limestone per ton to \$3.

The committee appointed to prepare copy for an Agricultural Limestone textbook reported that it had practically finished its work. Five thousand copies of this book were ordered printed at once, and more will be printed later.

An attractive and extensive exhibit is being prepared for the Ohio State Fair and other expositions.

A credit service system will be established and reports made to the Secretary of all accounts sixty days over-due. This service will give protection to limestone manufacturers at no extra cost to them.

New memberships will be vigorously solicited.



Shuttle conveyor for placing limestone in any of the kiln-feeding bins

# Lime Committee of the American Society for Testing Materials Reports

New Life Injected into Committee Work Through the Efforts of the Lime Association—Sand Investigations to Be Important Item—Agricultural Lime Includes All Kinds in Use

LAST SEPTEMBER Committee C-7 on Lime of the American Society for Testing Materials, was completely reorganized. The committee now consists of 21 members, of whom two-thirds are producers of lime. The chairman of the committee is D. Knickerbocker Boyd, a Philadelphia architect, and the secretary is Norman G. Hough, chief of the Construction Department of the Lime Association.

The work of Committee C-7 has been divided up into seven subdivisions upon which separate subcommittees are engaged, as follows: I. Co-ordination, II. Structural Lime, III. Agricultural Lime, IV. Chemical Lime, V. Chemical Analysis, VI. Plasticity, VII. Highway Lime.

## Structural Lime

The Sub-Committee on Structural Lime is conducting an investigation looking toward the development of a standard sand for laboratory tests of lime; the development of standard methods for the measurement of sand-carrying capacity and yield of lime, and the development of standards of practice for slaking differing limes. It is also formulating lines of investigation to determine the general practice, characteristics, and behavior of lime in the mixing and aging of mortars and plasters. To this end it has secured the Codes and Building Laws of all principal cities of this country, some of those overseas, and in addition, is receiving the co-operation of the U. S. Bureau of Standards, the Lime Association, the Operative Plasterers and Cement Finishers' International Association of the United States and Canada, and other organizations.

The committee has also taken steps toward co-operation with Committee C-11 on Gypsum on questions of nomenclature, and on the use of mixtures of lime and gypsum for the finishing coat of wall plaster; with Committee C-1 on Cement on the use of lime in cement mortar, and with Committee C-9 on Concrete and Concrete Aggregates on the use of hydrated lime in concrete.

The sub-committee has proposed a method for the determination of the fineness of hydrated lime:\*

While the committee is in favor of continuing the limits of fineness as ex-

pressed in the present Tentative Specifications for Masons' Hydrated Lime, certain changes have been suggested by members of the committee and these are now being investigated.

In view of the fact that the durability of wall plaster depends largely upon the methods of application, as well as upon the properties of the lime and its correct admixture with appropriate materials composing plaster, this sub-committee is working upon specifications for interior plastering for later submission to the society.

## Agricultural Lime

The Sub-Committee on Agricultural Lime has decided that the term "agricultural lime" includes any material containing either the radical calcium oxide or a mixture of calcium and magnesium oxide in any of the forms of oxide, hydrate or carbonate. This sub-committee has further decided that the magnesium oxide is at least equally as valuable as calcium oxide for agricultural purposes.

In co-operation with the Lime Association, this sub-committee is now investigating the fineness, solubility, purity, distribution, and availability of pulverized limestone.

## Chemical Lime

The Sub-Committee on Chemical Lime has learned that a loss approximating \$150,000,000 occurred to the citizens of the United States during the war, due to an inadequate understanding of the properties and qualities of the lime used as a chemical reagent in manufacturing industries. This has impressed upon the sub-committee the importance of determining the qualities and characteristics of lime which will best meet the needs of each particular industry. The sub-committee now has on its list 116 different industries which are being studied. These studies will be conducted as far as possible through co-operation with technical societies of the industry involved.

## Chemical Analysis

Most of the work of the Sub-Committee on Chemical Analysis has been completed. Tentative methods for chemical analysis of limestone, lime and hydrated lime have been adopted.

A few minor matters such as methods for determining phosphorus, manganese, etc., are now being developed.

## Plasticity

The Sub-Committee on Plasticity has proposed the following definition of "plasticity":

"Plasticity is that property of a material, or combination of materials, by virtue of which it deforms continuously and permanently during the application of force."

The sub-committee also has designed an instrument for the measurement of this property. This instrument is now being used by the U. S. Bureau of Standards. A program for field tests will supply information as to the value of the results obtained with this instrument.

A petrographic study is also being made to obtain further light on the probable causes which contribute to the plasticity of lime.

## Highway Lime

The work of the Sub-Committee on Highway Lime was inaugurated by an inspection of the hard surfaced roads in which hydrated lime was used in the State of Delaware. This will be followed by an active program to develop the value of lime for this purpose.

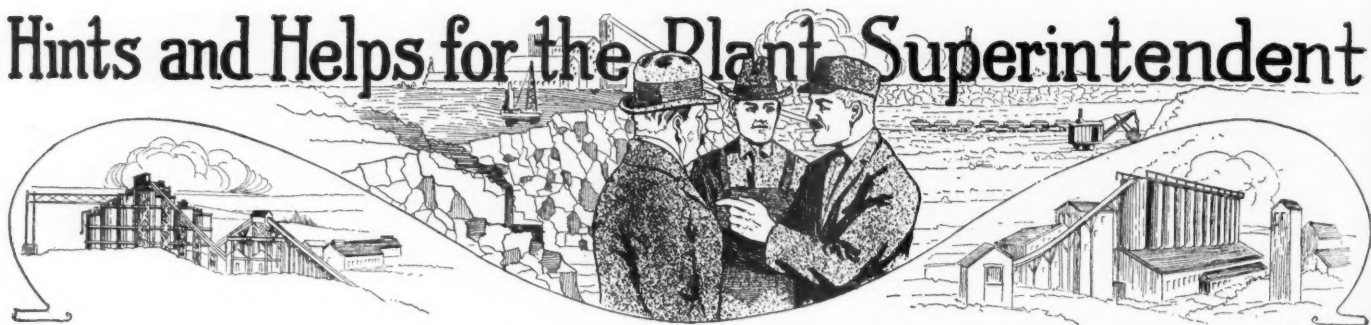
The committee adopted the following resolution:

That, whereas, sand is a material used broadly for construction purposes, and, whereas, nearly all of the "Group C" committees of the Society are interested in, and have to deal with the question of sand as an admixture with the material over which each committee has jurisdiction, the Executive Committee be requested to instruct all standing committees interested in sand to elect sub-committees on this material; and that the Executive Committee be requested to create a standing Committee on Sand to be composed of one delegate from each of the above mentioned sub-committees."

The committee further suggested the desirability of the adoption by the Society of standard testing sieves promulgated by the Bureau of Standards. The 200-mesh sieve has been carefully standardized in the Specifications and Tests for Portland Cement and standards for certain meshes have also been adopted by the Society for use in road material work; and the committee believed that this work might well be extended to cover the adoption of standard sieves for all purposes. The report also includes specifications for chemical tests of lime.



# Hints and Helps for the Plant Superintendent



## Shipping Agricultural Limestone in Box Cars Without Grain Doors

**I**NQUIRY was recently made among a number of prominent shippers of agricultural limestone as to methods of shipment of this commodity since the Railroad Administration refused to allow the railways to furnish grain doors for other commodities than grain.

Evidently this order is merely another evidence of the lack of understanding of some of the fine points of railroading which have been displayed so frequently by our long-distance railway control officials. In any event some practical railway operating men on really first-class roads appear to be ignoring the order in their own interests as well as their shippers'.

Other shippers are obliged to furnish their own grain doors with lumber costing around \$25 per M. Naturally the tendency is to use as little lumber as possible, which often means re-handling the material in the car—banking it up in the ends, so that two 8-in. boards in the car doors will answer the purpose.

A Southern producer states that it takes 50 ft. of rough 1-in. boards to make grain doors 3 ft. high. Lumber costs this limestone man \$24 per M, which makes the cost of the doors about \$1.20 per car for the boards alone. The labor cost is estimated at 30c, making \$1.50 in all, or about 5c per ton. Other estimates run as high as \$3 per car, or 10c per ton.

One New England shipper is overcoming this difficulty by building up a trade in returnable cloth bags. He makes an additional charge of 25 cents per ton for the bagging and charges the purchaser 10 cents per bag, which is refunded when the bags are returned.

Many middle west shippers are avoiding the extra expense for grain doors by making all shipments in open-top cars. This is the universal practice in Illinois and Indiana with material as fine as 50 per cent through a 20-mesh, and about 20 per cent through 100-mesh. With finer material there seems to have been little experience.

It is pretty well established that rain and moisture do no harm to the mate-

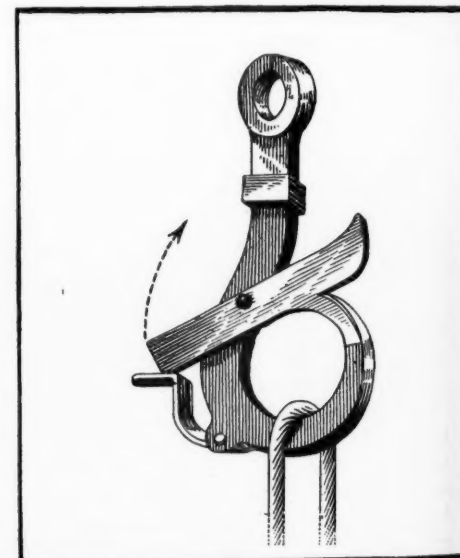
## Question Box

**G**OT a problem you want help on? Send it in. We will agree to find some operating man who can answer it.

plant. No rock products repair shop is really complete without one.

## Improved Safety Hook

**T**HE ACCOMPANYING SKETCH shows a novel type of safety hook designed by J. Carroll of Tacoma, Wash. It can be made in any forge shop and is so simple that no description other than the sketch is needed to make clear its construction. Its safety and reliability have been thoroughly tested.



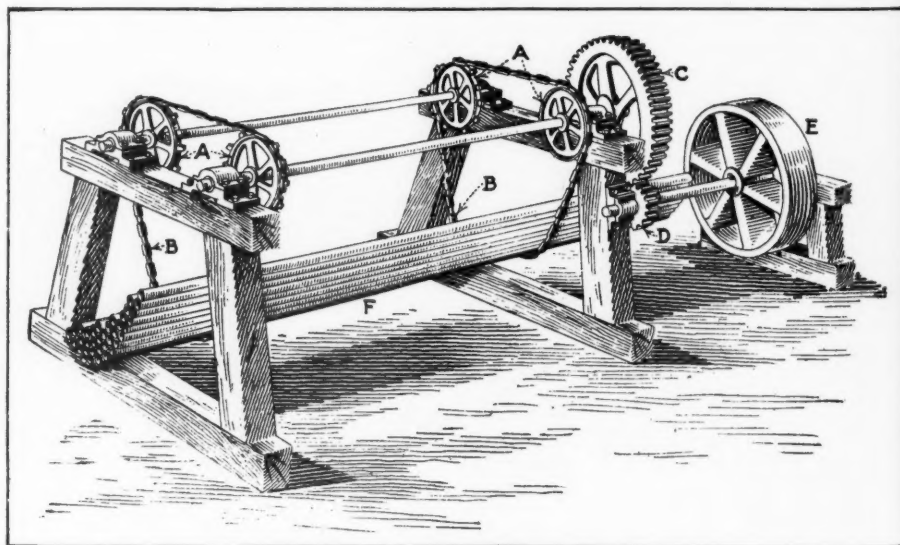
Safety hook designed by Washington man

## Cleaning Boiler Tubes

**M**ANY ROCK PRODUCTS PLANTS have to make their own power for operating. That means a boiler plant. With boiler tubes at present prices it may pay to clean old tubes rather than buy new ones, particularly where a plant has any kind of a repair shop or machine shop.

With the device illustrated, according to J. A. Carruthers, in "Power," old tubes were cleaned and welded back into the boilers at a cost of about \$3.20 each, when new tubes were costing about \$11 each. In replacing the tubes the new ends were put at the back of the boilers.

This demonstrates one of the many uses which can be made of a portable oxy-acetylene welding outfit around a



Home-made tumbler for cleaning out boiler tubes



### Time Clocks for Employees

QUITE A FEW quarry and gravel plants are saving a timekeeper's salary by using factory time clocks. The view below shows the office of the Ladd Lime & Stone Co., Cartersville, Ga., with a time clock for all plant and quarry employees on the porch.



Time clock for quarry plants

### Dynamite Use Profitable in a Sand-Gravel Pit

DYNAMITE is used by the H. D. Conkey Co., of Mendota, Ill., at its Moronts pit for the greater and easier production of sand and gravel. Using dynamite in a gravel pit regularly and as part of the system of production is something of an innovation. But C. G. Knoblauch, supervising engineer of the Conkey properties, declares there is a profitable reason for so doing.

It is not done because the nature of the pit is different than any other, but because the explosive is simply an economic factor. Loosened sand and gravel is more economically handled and more rapidly moved than is material packed solid in the bank.

At the Moronts pit there is a power scraper. Sufficient explosive is used at one time to blow up enough material to keep the scraper humming on scraping and to reduce to a minimum power and time otherwise employed on digging into a solidified mass. Three sticks of 40 per cent dynamite costing about 40 cents is

used. This will loosen enough material to fill ten cars.

After the explosion the scraper is raced through, meeting little resistance, of course, and doing much more work than it would with solid material. The sand and gravel runs in layers in the bank, which is 30 feet high. The explosion mixes it up.

### Fine Sand Recovery

THE VIEW BELOW shows how a California gravel producer is meeting the problem of fine sand recovery. Being in a mining district, he is familiar with the use of the Dorr thickener, an agitated settling tank, which was described in detail in *ROCK PRODUCTS*, April 12, 1919, page 33, in connection with the article on the plant of the American Limestone Co., Mascot, Tenn. The thickener can be seen at the extreme right of the picture. This device is claimed to be particularly efficient in the recovery of clean fine material, and may find a wide application in the sand industry as the demand for clean plaster sand increases.



Sand and gravel plant of the Saratoga Crushed Rock Co., California

# Must Introduce More Labor Saving in the Building Stone Industry

Oliver Bowles, Expert of the United States Bureau of Mines, Says General Rise in Costs May Benefit Building Stone Industry

THE RECENT PROMINENCE given in newspapers and other periodicals to high rentals and shortage of living accommodations, particularly in the larger cities, has emphasized the fact that America as well as Europe has an acute housing problem. While legislation designed to encourage building may be a necessary step, the main problem can be solved in one way, the logical solution being the construction of more and more houses. A broader realization of this fact is evidenced by recent gains in building contracts, and by increased agitation for still greater activity.

## Stone-Working Machinery Keeps Down Costs

With an increased activity in most branches of the building trades and the prospect of a much greater increase, producers of raw materials may confidently expect a stronger demand for their products.

Limestone, marble, sandstone, and granite are superior types of building materials, and all that prevents their wider use is their high cost as compared with other structural materials. Every small depression in relative cost as compared with other types of building stock, tends to widen the market by bringing stone structures within the reach of a larger class of builders. Now that all building materials command a considerably higher price than in pre-war times, it is highly desirable that every effort be made to keep the price of building stone down to the lowest possible level.

There is no doubt that the cost of building stone can be lowered without any depression in wages by a wider use of machinery. Already America is far in advance of European countries in the use of machinery in stone working, and as a consequence the cost per cubic foot of Indiana limestone averages less than that of the English Portland stone (the two stones being similar), although wages paid in the Indiana district are about twice as high as in England. The wide use of Indiana stone is largely due to economical methods of handling it, and a wider use of other types of stone could be brought about similarly by introducing more machinery into quarries and shops. The stone worker has, therefore, nothing to fear from the wide use of mechanical equipment, for it demands

more skilled workers at higher wages, and the reduction in cost that results from the use of such equipment broadens the market, with consequent increased activity in the stone industries.

It is evident, therefore, that there is no more fruitful field for improvement in conditions in the stone industry than that of highly developed mechanical equipment.

## Grinding Pebbles and Tube-Mill Liners

Production in 1918 Shows Falling Off—Growing Use of Other Grinders

A FALLING-OFF IN THE PRODUCTION of pebbles and liners for use in tube mills, as shown by final figures for 1918 compiled by the United States Geological Survey, Department of the Interior, reflects both uncertainty of market and changes in grinding practice.

### Grinding Pebbles

Natural pebbles for grinding rock, ores, minerals, cement clinker, and many other materials were obtained in 1918, as in preceding years, from the beaches between Oceanside and Encinitas, San Diego County, Calif. According to reports received by the Survey, the entire output was marketed by Robert Burns & Co., Oceanside; the Pacific Coast Pebble Co., Encinitas; and Thebo & Tingman, Encinitas. The production of these pebbles in 1918 was considerably smaller than in 1917, probably in large part because the growing use of steel balls is supplanting the use of pebbles, but the decrease was due in part to the uncertainty of the market, which deterred pickers from collecting and sorting stocks that they might have marketed.

The output of "artificial pebbles" in 1918 was considerably greater than in previous years. These so-called artificial pebbles are either roughly cubical or mechanically smoothed and rounded blocks of quartzite manufactured by the Jasper Stone Co., Sioux City, Iowa, or mechanically smoothed and rounded blocks of silicified or chalcedonized rhyolite manufactured by Omer Maris, Manhattan, Nev.

In 1918 the sales of pebbles and of

## Launch Federal Ship Made of "Puffed" Brick Concrete

OAKLAND, CALIF.—The 7,500 ton concrete ship "Palo Alto" was launched at Government Island, Oakland, May 29.

The "Palo Alto" is 435 ft. long, has a 54 ft. beam and a depth of 36 ft. "Puffed brick" was used for the concrete mixture and in spite of the large amount of steel used in reinforcing the concrete, it is estimated that she is 17 per cent lighter than a steel vessel of similar size.

The first cement pour was made on January 20, the entire pouring for the main structure being done in two weeks. Painted a battleship gray, the "Palo Alto" looked like a steel ship in the water.

cubes and artificially rounded blocks for use in grinding amounted to 9,734 tons, valued at \$82,350. This was a decrease, roughly, of 2,300 short tons, or nearly 20 per cent, compared with the sales in 1917. The value, however, shows an increase of nearly \$24,000, or about 30 per cent, compared with that for 1917. Besides this marketed output there was an indeterminable consumption, probably large, of substitutes for grinding pebbles by mills which used local pebbles, boulders, lumps of ore, or native rocks.

Only estimates are available to show the quantities of flint pebbles imported. The records of the Bureau of Foreign and Domestic Commerce indicate that the quantity of grinding pebbles imported in 1918 was probably a little over 10,000 short tons, about 70 per cent of which came from Denmark and the remainder from France.

The total new supply of grinding pebbles contributed to domestic markets in 1918 appears thus to have been about 20,000 short tons, as compared with approximately 25,500 tons in 1917, 32,000 tons in 1916, and 31,000 tons in 1915. This diminishing supply is evidence of the growing use of steel balls or other substitutes for grinding pebbles.

### Tube-Mill Liners

The domestic output of flint or quartzite tube-mill lining in 1918 was 2,535 short tons, valued at \$46,634, compared with 3,050 short tons, valued at \$59,250, in 1917. In 1918 there were only two producers—the American Flint Co., Iron City, Tenn.; and the Jasper Stone Co., Sioux City, Iowa.



# New Fire Tests of Concrete Remove Stigma From Limestone Aggregate

Slag Aggregate Proves Excellent Qualities—Gravel Rather Hard Hit but Nevertheless Admitted an Economic Necessity

**M**ATTERS OF EXTREME INTEREST to producers of mineral aggregate were discussed at the recent annual conventions of the American Society for Testing Materials and the American Concrete Institute. The report of the committee on Fireproofing of the American Concrete Institute gave the results of a series of fire tests of more than 100 full-size building columns. These tests covered all the important types of fire-resistive columns and were conducted jointly by the National Board of Fire Underwriters, the Associated Factory Mutual Fire Insurance Companies and the United States Bureau of Standards.

## Effect of Aggregates

The report states in part that "previous fire tests have indicated that there is an important difference in the fire-resistive properties of different aggregates. Ira H. Woolson, in his final report to the American Society for Testing Materials of investigations of the fire resistive properties of concrete made in 1905, 1906 and 1907, reported adversely on the pure quartz gravel which is extensively used in the vicinity of New York City. Shortly afterward, the British Fire Prevention Committee reported adversely on the behavior of gravel concrete in a fire test of floor arches. Further evidence was developed by tests made by the Bureau of Standards and reported to the American Society for Testing Materials in 1917. These test results have been so consistent that it appears to have been well established that the physical properties of gravel, that is high in quartz content, are not such as to make it as suitable as other aggregates for fire-resistive concrete.

"Investigation of the failure of concrete construction in recent severe fires clearly indicates that the damage was much greater than would have been the case if any one of a number of aggregates, other than gravel of high quartz content had been used. This was especially true in the case of the fire at Far Rockaway, New York. This fire has been thoroughly investigated. A complete report of the fire and of the condition of the building, with conclusions attributing the damage in large part to the pure quartz gravel aggregate, was prepared for the National Board of Fire Underwriters by its Consulting Engineer, Ira H. Woolson. Copies of this re-

port are obtainable. A further investigation was made by a special committee of the American Concrete Institute and a report presented by Richard L. Humphrey, dealing with the fire, the condition of the building and the methods used in reconstruction. Great importance was attached to the nature of the aggregate in this report.

"To this evidence may be added that of two great factory building fires which occurred in London in 1917. Both of these latter fires were of great severity and long duration. Both were started by an explosion. It was impossible to determine how much of the damage was caused directly by the explosion, but after thorough investigation the British Fire Prevention Committee attributed a large part of the damage to the inability of the Thames ballast (gravel) concrete to withstand the destructive stresses of a severe fire, as is shown by their reports, from one of which the following two paragraphs may be quoted:

"It is clearly shown that Thames ballast or gravel concrete is an unsuitable material for reinforced concrete in buildings where the risk of a severe fire has to be considered.

"Where a suitable aggregate or combination of materials is used in the future and the reinforcement accorded proper protection, only superficial damage need be expected, i. e., damage repairable without extensive reconstruction.

"In the fire tests of concrete columns made by the Bureau of Standards, gravel concrete columns were shown to be greatly inferior in fire resistance to columns having no other aggregates. While this applies to all types of columns, the contrasts were greatest in round columns, vertically and spirally reinforced and in vertically reinforced square columns. It is probable that similar results would be obtained from all gravels made up largely of highly silicious materials such as sandstone pebbles, quartz pebbles and granite pebbles.

"It is clearly indicated that serious structural damage by fire in concrete buildings could be prevented in large measure by using, where it is economical to do so, either limestone, trap rock, blast furnace slag or burned clay aggregate and, where none of these aggregates can be used economically, by paying special attention to certain structural details. In the case of columns, there is evidence that vertically reinforced round

columns, without spiral, resist fire better than square columns without spiral. This applies particularly to gravel concrete columns. It does not appear to be true of columns made from the more suitable aggregates. Gravel concrete columns having spiral reinforcement appear to be particularly susceptible to spalling. It has been found that the addition of 1 in. of cement plaster, held in place by light metal mesh, was sufficient to prevent the loss of the protective covering by spalling in the case of spirally reinforced gravel concrete columns, and that columns so protected lost but little of their strength in the 4-hr. test. There seems to be added merit in such protection in the fact that the thickness is uniform over the columns, whereas any inaccuracy in placing steel would result in protective concrete being thinner on one side than on the other.

"The following recommendations are therefore made, pending further developments along this line:

"1. That for fire-resistive construction, limestone, trap rock, blast furnace slag and well burned clay be given a preference over highly silicious gravels.

"2. That in cases where gravel aggregate is to be used, with no additional protective material over the concrete, round columns be given a preference over rectangular ones.

"3. That where gravel aggregate is used, all columns, but especially rectangular columns and round columns with spiral reinforcement, be given the additional protection of approximately one inch of Portland cement plaster either on metal lath or reinforced by light expanded metal."

Walter A. Hull, Chairman.

Mr. Hull in discussing the tests in greater detail in a paper before the American Society for Testing Materials, stated that the use of gravel in many instances was dictated by economic necessity and went into detail as to the manner in which such columns could be made reasonably fireproof. These tests were made with eastern gravels and not with some of the western limestone gravels.

Both Ira H. Woolson and Mr. Hull acknowledged that many previous statements in regard to the failure of limestone concrete in fire tests were inaccurate and based on incomplete data.



# Sand Washing and Collecting Devices For the Gravel Plant

General Summary of Practice in Sand and Gravel Industry and Some Experience and Devices in Allied Mining Work

**T**HE PRODUCTION OF CLEAN SAND is certainly one of the most desired aims of a modern sand and gravel plant. Moreover, there is a growing tendency to separate sand more and more into a variety of sizes for different purposes. Even where a sand is used

By Nathan C. Rockwood

ated washer is constructed on the principal of a flight conveyor. The vanes of this conveyor travel through a water-

tight box or tank and the washed material is discharged over a weir at the upper or far end of the box. The waste water overflows either at the side or the lower end of the tank.

With this device a very clean product can be produced. Usually the tank,

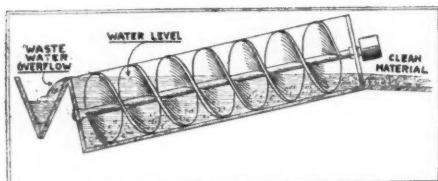


Fig. 1. Archimedes screw or log washer

for concrete it may become desirable to proportion the sizes to something like the prescribed ideal.

## Screw or Log Washers

Where the sand is very dirty or where an exceedingly clean product is desired some kind of washing device in which the sand is agitated is generally used. The two principal types of power-operated washers are shown on this page. They are the Archimedes screw washer, or log washer, and the flight-conveyor type of washer.

The screw washer is very largely used in the glass sand industry, where an exceedingly clean pure product is absolutely essential. Very large washers of this general type, with paddles, instead of complete spiral disks, are also used extensively in the Minnesota iron range country for washing iron ore. Such washers are seldom found in the commercial sand and gravel industry, because they are expensive in power and maintenance and produce a product of greater refinement than necessary for present-day concrete aggregate.

However, they have a number of advantages besides producing a clean material. By regulation of the flow of water, the angle of the box and the elevation of the overflow weir at the end, a product of almost any proportions of fine and coarse material may be had.

## Flight Conveyor Washers

The second type power-oper-

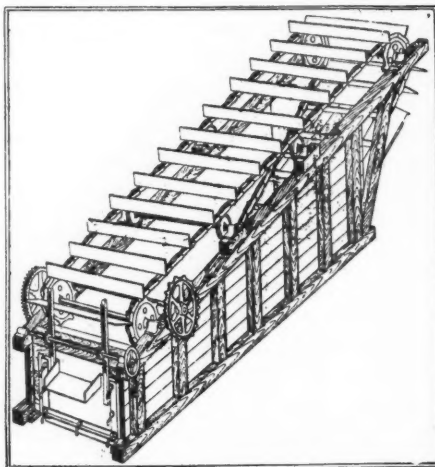


Fig. 3. Flight-conveyor type of box washer

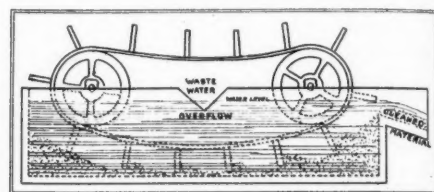


Fig. 2. Essential details of flight-conveyor-washer

or tank bottom, is on an incline so that the water applied runs with more or less of current. The finer the output, of course, the less the current required. This device also is capable of considerable adjustment in both the angle of incline, amount of water and height of discharge weir.

The largest commercial sand and gravel plant using this device exclusively for sand washing and recovery is probably that of the Boston Sand & Gravel Co., described in *Rock Products*, April 12, 1919.

The Good Roads Machinery Co., Fort Wayne, Ind., makes washers of this type one of the features of the plants which it equips. This company makes a standard design, as illustrated in this article. These standard tanks are made in sizes from 18 in. x 8 ft. to 4x23 ft., ranging in capacities from 15 to 100 tons of sand per hour. This manufacturer states that the horsepower required is nominal, ranging from one to five.

Washers of this type are used extensively for washing both crushed stone and stone screenings at the plant of the Dunbar Stone Co., River Rouge, Mich. This plant was described in *Rock Products*, March 12, 1919.

## Tilting Box Washers

The simplest sand washing device, and what is claimed to be about as satisfactory as any,

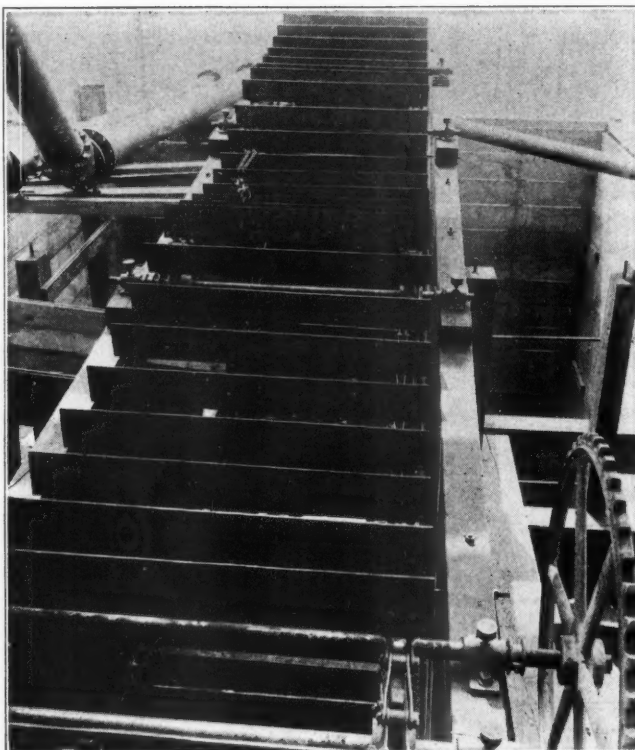


Fig. 4. Large size flight-conveyor washer made by the Good Roads Machinery Co.

is the ordinary tilting settling box or tank. This is the type of sand-recovery machinery met with in nine out of ten sand and gravel plants. Fig. 5 shows the details of the ordinary home-made timber tank.

This device is only one step removed from the original process of sand recovery where the wash water from the screens was chuted direct to water-tight tanks, in which the sand settled and the dirty water overflowed at the top. This process gave a clean gravel but the sand was scarcely washed at all.

The tilting tank is built either of wood or steel and is simplicity itself, requiring no power and very little attention. It

the constant tilting and righting of the box helps to furnish the agitation which keeps the mud and silt in suspension near the surface of the water and causes it to overflow almost entirely when the tank tips up.

Steel tilting tanks with various patented improvements are made by the Webster Manufacturing Co., Tiffin, Ohio, the Stephens-Adamson Manufacturing Co., Aurora, Ill., the Link Belt Co., Chicago, Ill., and other manufacturers who specialize in sand and gravel plant design and construction.

Fig. 7 shows the steel tank manufactured by the Stephens-Adamson Mfg. Co. This tank is entirely of steel con-

structed as to make it impossible for the sand to lodge in corners and thus keep the tank tilted. The tank has, of course, stops to prevent its tipping too far, which are not shown in the illustrations.

The valves of this tank are evidently more sensitive than those of the standard type. These valves are ball disks, the seats for which are nipples held in place by set screws, which can be loosened and the nipples reversed when the seats become worn. This insures a tight joint and prevents pebbles from getting into the opening and allowing the sand to leak out.

Mr. Supernau states that he has four

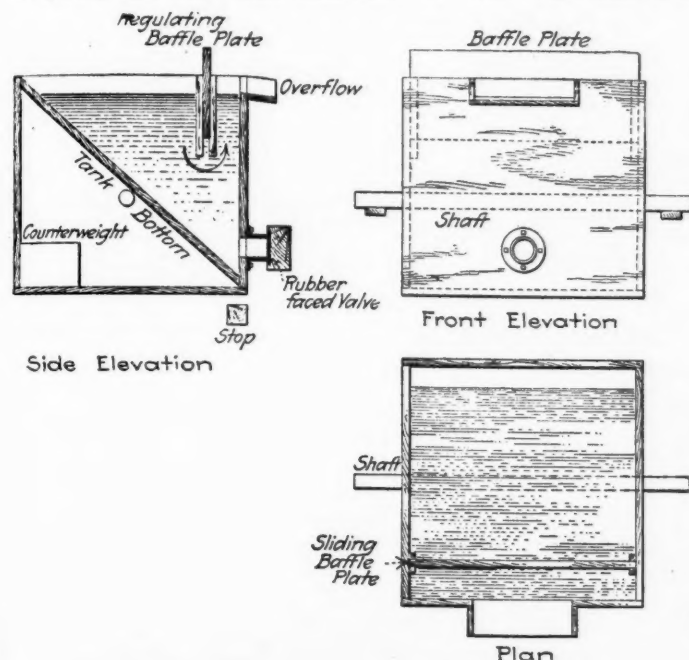


Fig. 5. Simple automatic tilting box washer

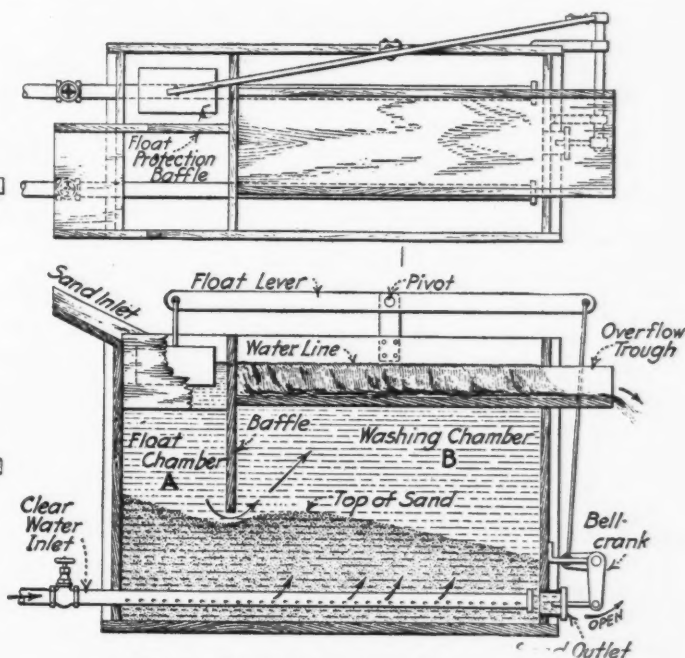


Fig. 6. Improved automatic box washer

is ordinarily built in sizes from 4 to 6 ft. square. It is built with a sharply sloping bottom as shown in Fig. 5, with a valve or outlet on the front side near the bottom for discharging the clean sand. A counterweight, either stones or iron, is sometimes built into the opposite side of the tank. The whole box is supported on two pivots or axles, near the center of gravity of the device.

The operation is as follows: Water and sand are spouted to the box from the screens. The dirty water overflows continuously at the overflow weir on top, while the sand settles and accumulates in the V-shaped chamber. When the quantity of sand deposited is sufficient to overcome the effects of the counterweights, the box tilts forward, opening the sand-discharge valve and allowing the sand to flow out. As soon as the sand has been discharged the counterweights tilt the tank back into its normal position, thus closing the valve.

The action is entirely automatic, and

struction, with water-tight riveted joints, and is claimed to be entirely weather-proof. In operating it the manufacturer states that many special means are employed at different plants for further separation of the sand, such as drilling holes 1 in. in diameter in the bottom of the overflow sluice.

Fig. 10 shows the standard tank made by the Webster Mfg. Co. The ordinary size of these is 5 ft. square at the top. They are made of  $\frac{1}{4}$ -in. steel.

The latest thing in tilting tanks is shown in the photographs Figs. 8 and 9. This is the product of a practical sand and gravel operator, who claims a number of advantages for it over the ordinary tilting settling tank.

This tank was designed and built at the plant of the A. Y. Reed Gravel Co., Elgin, Ill., by W. E. Supernau. It was referred to in the description of this plant in *ROCK PRODUCTS*, May 22, 1918, but is here described and illustrated for the first time. The inventor claims for this tank that the valves are so con-

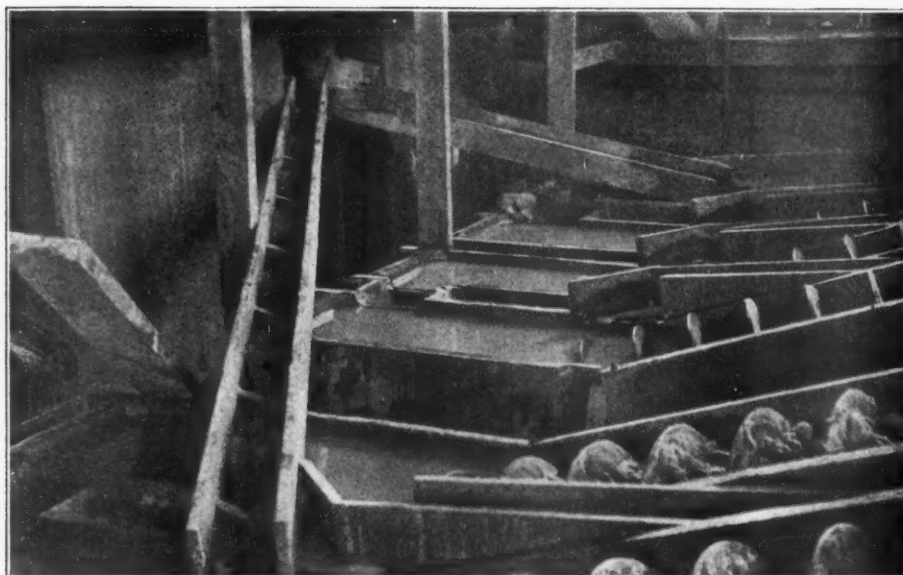
of these tanks in operation at the present time and that they are giving perfect satisfaction. The valves are patented and are made in Elgin under Mr. Supernau's supervision.

#### Another Automatic Tank

An automatic tank of somewhat similar action to the tilting tank is shown in Fig. 6. T. R. Martin, of Cincinnati, Ohio, is credited with this design. The box is rectangular in shape with an overflow trough extending about three-fourths of its length. This overflow trough is placed a few inches below the top of the box. Water overflows from the box the whole length and on both sides of the trough and is wasted at the end of the trough.

At the inlet end of the box is a baffle, the width of the box and extending down about half its depth. The inflow of dirty sand enters the space between the end of the box and the baffle. A part of this inlet chamber is separated off from the main part by another baffle. In this





Battery of screw washers in a glass sand plant

compartment is a float which operates the outlet valve.

Perforated pipes in the bottom of the box furnish the wash water and keep the material in the box in constant suspension. In operation the sand and water enter at "A," the water escaping through "B." The discharge valve remains closed until the sand in the bottom of the box reaches about the bottom of the baffle, when the water level in "A" will rise, thus raising the float and opening the outlet valve. This device is claimed to be particularly efficient in recovering fine sand.

#### Arrangement and Operation of Tanks

Generally two, sometimes four, settling tanks are used in series. The tank is really supplementary to the screens but when properly adjusted may serve the purpose of a fine sand screen, as shown in the two lower arrangements of Fig. 11. The correct arrangement can never be determined except by trial and experience with the particular material handled, and by the size, or quality, of the material it is desired to produce.

More trouble is usually experienced in the operation of the fine sand tank than with the coarse sand tank. There is a tendency for the fine sand to stick in tank, only that portion of it immediately over the valve opening being discharged. When this happens the tank will frequently "spill" or remain tilted and allow the dirty water to flow into the sand bin and ruin its contents.

This "spilling" can be cured in some degree by providing a small opening with a valve stop, similar to the main discharge valve, near each side of the tank and about one-third of its depth from the bottom. These upper openings keep the sand more agitated and prevent its becoming settled or compact.

#### Cone Separators

A sand separator which has been used to some extent in plants designed by the Raymond W. Dull Co., Chicago (now affiliated with the Link-Belt Co.), was devised by Mr. Dull a few years ago and is illustrated in Fig. 12.

The body of this separator is conical in form, suspended from a lever system of scale-beam type, and fitted at the lower or small end of the cone with a discharge valve, fixed to a stem which rises through the center of the cone and is so attached to the lever system as to act with it—the valve opening as the cone descends, and vice versa.

Soil water and scoured sand from the screens are delivered into the conical body of the separator. The sand settles to the bottom and gradually accumulates, while the water, soon filling the

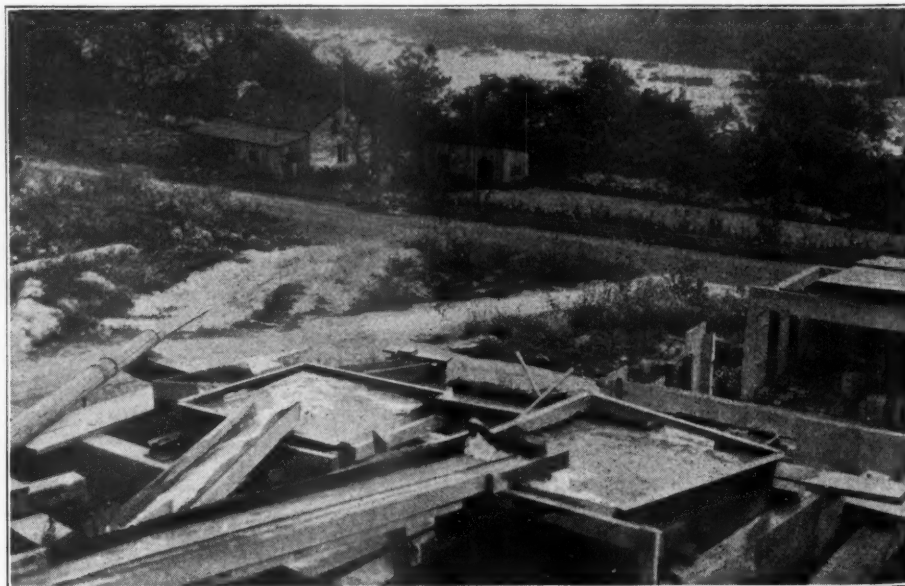
tank, overflows and runs continuously out the spillway, carrying with it the impurities in suspension.

The poise of the tank with levers and counterweight is such that the increased weight due to the accumulation of sand in the tank acts to overcome the leverage of the counterweight, causing the valve to open and allow the excess of sand to escape to the bin below. The passage of sand continues until the tank is in equilibrium again or has discharged the excess weight of sand.

Another cone separator, which has been extensively used in the mining field and to a small extent in western sand and gravel plants is known as the Allen cone. This is illustrated in Fig. 13.

The Allen cone is made in two forms known respectively as the sand cone and the slime cone. The sand cone is used where the spigot discharge is to be sand, or other granular matter, and the slime cone where the spigot discharge is to contain clay or a similar material. In some cases the two forms are used in series.

The action of the sand cone is claimed to be very simple. The crushed rock, or sand, settles out of the feed stream to form a sand bed, as shown in the sectional cut. When the settled sand reaches the mouth of the small cone, which is marked "B," it partially obstructs this mouth and "backs up" the water in "B." This causes the float "C" to rise, and this rise, through the connecting parts, opens the spigot at the bottom of the cone, so that the sand flows out in a steady stream so long as the feed coming to the cone contains sand or other settling material. When there is none of such material coming the spigot automatically closes and remains closed until the feed of settling material is resumed. No power is needed



Tilting boxes over sand bins showing special feeding arrangement



as all the force that is necessary to open and close the spigot is furnished by the feed stream. As the action of the cone is automatic, it requires very little attention.

The slime cone automatically controls the discharge from the spigot, but by a different method. In this machine there

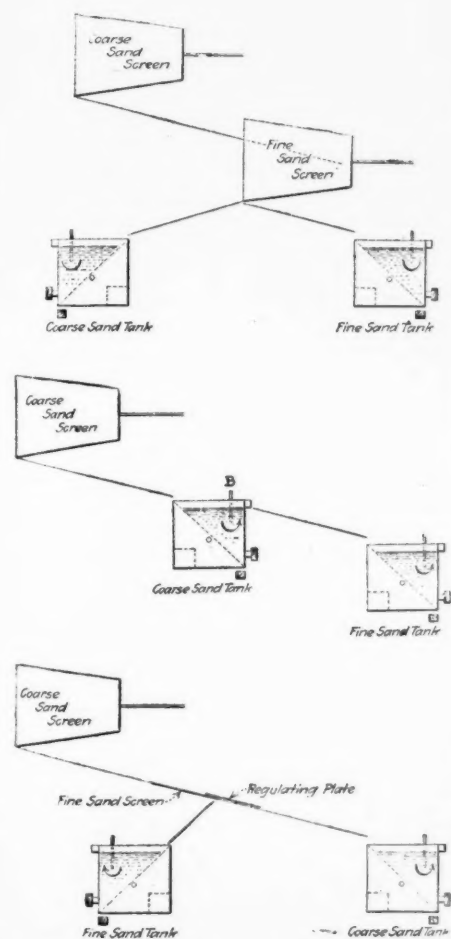


Fig. 11. Arrangements of sand tanks and screens

is a double cone submerged in the body of the main cone which rises and opens the spigot when the mixture in the cone gets thicker and falls and closes the spigot when the mixture gets thinner. This action keeps the spigot discharge at the same consistency, which is of great importance in the washing and handling of clayey material. Like the sand cone, the slime cone automatically closes the spigot when the feed ceases and opens it when the feed is resumed.

Material as large as  $\frac{1}{4}$ -in. diameter can be handled by the sand cone, as well as material of any fineness so long as it is of a sandy or granular nature. Clayey material, either by itself or mixed with sand, can be handled by the slime cone. A combination of the two is adapted to the separation of such materials as clay and sand, where very clean products are desired. The mixture is first fed to the



Fig. 8. Supernau tilting sand box.

enough to fall through this current. The block "c" is fastened to a vertical shaft or rod, so that the opening can be adjusted.

In type "C," Fig. 14, water is forced through a vertical pipe "e" from the top instead of from a horizontal pipe at the side, as in "A" and "B." As the water

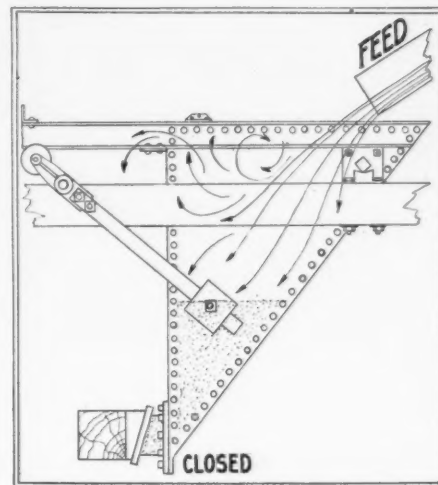


Fig. 7. Stephens-Adamson steel sand box.

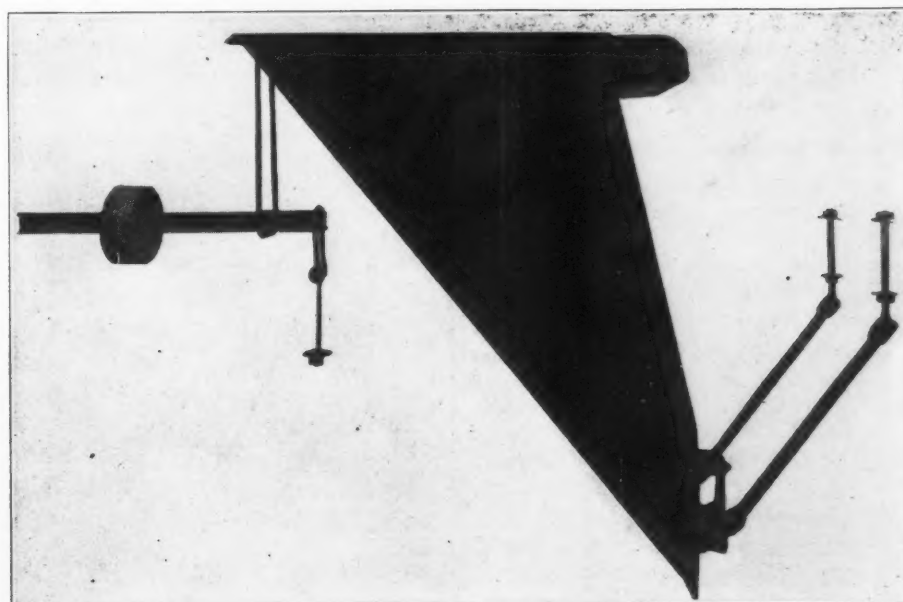


Fig. 9. Supernau improved sand box, showing special valves

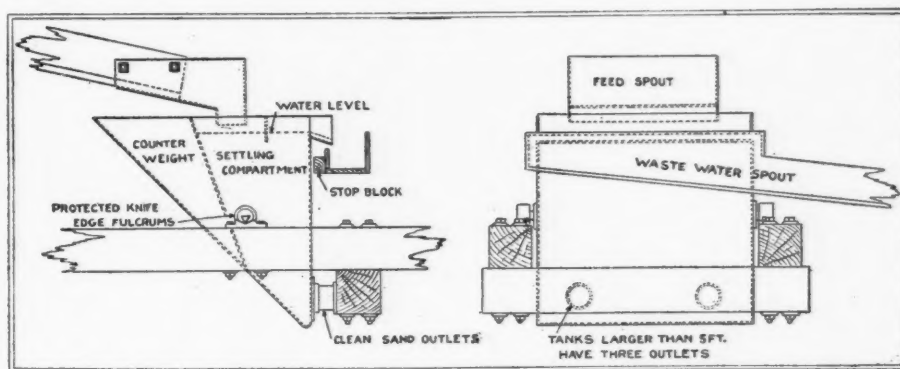


Fig. 10. Webster Mfg. Co. sand box, showing built-in counterweight



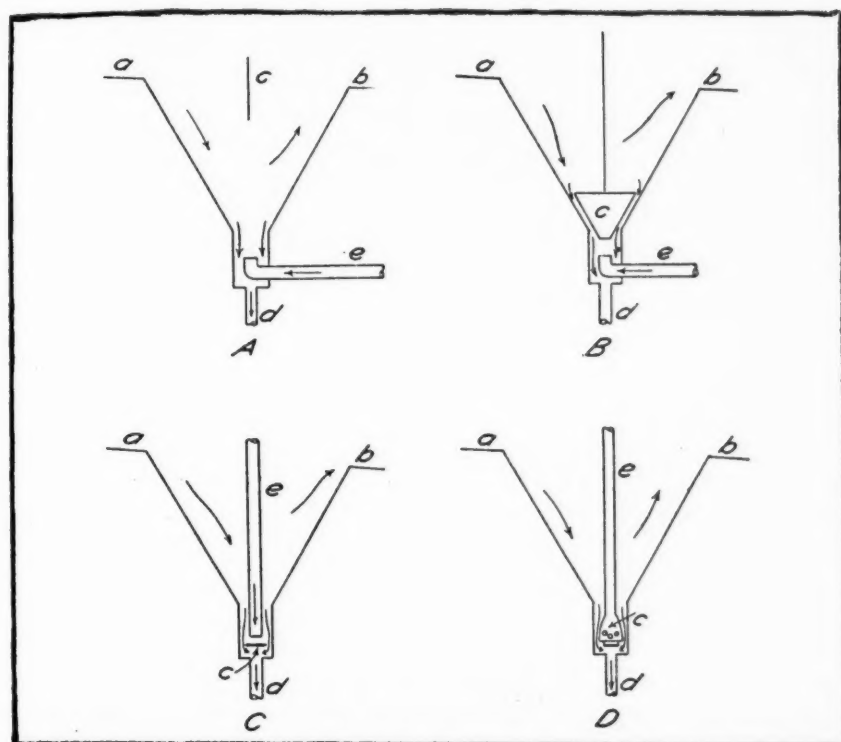


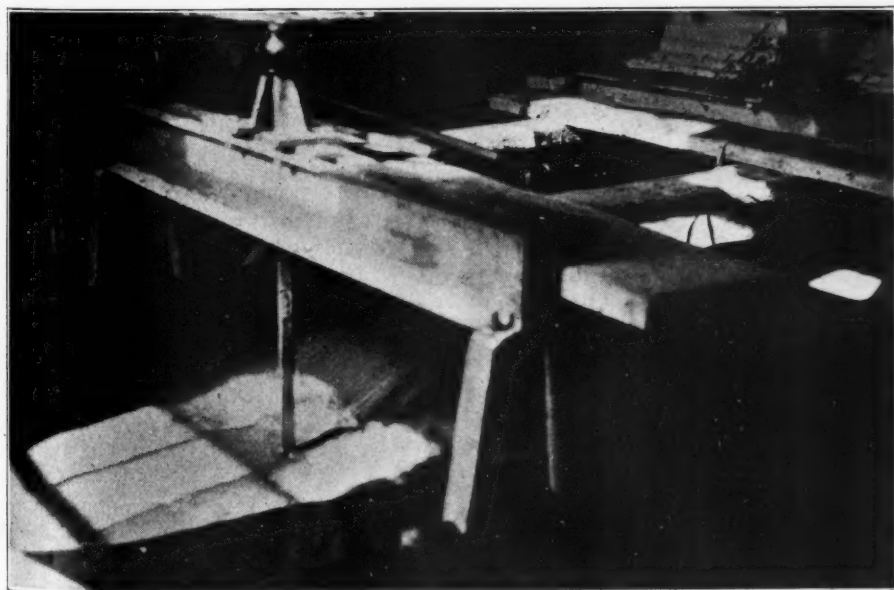
Fig. 14. Various types of hydraulic classifiers used in mining and metallurgy

the classifier to prevent air binding, or the formation of air bubbles as the water and sand rise through the classifier.

While none of the hydraulic classifiers described above appear to have been used to any extent in the sand and gravel industry, the principles involved are the same, and the up-to-date operator is never satisfied so long as any operation in his plant may be improved. It is up to some progressive operating man to find out if the sand box can be improved upon by the application of experience in identically the same operation in the mining field.

### Share Your Experience

**IN ORDER TO SUPPLEMENT** this article with the experience of practical sand and gravel plant operators, descriptions of other sand-settling tanks, and the experience of various operators with some of the devices described here, are earnestly solicited. Rock Products will pay any plant superintendent \$2 in real money for a publishable idea.



Continuous-operating sand box with cone-shaped bottom and hand-operated valve, employing the principle of the hydraulic classifier

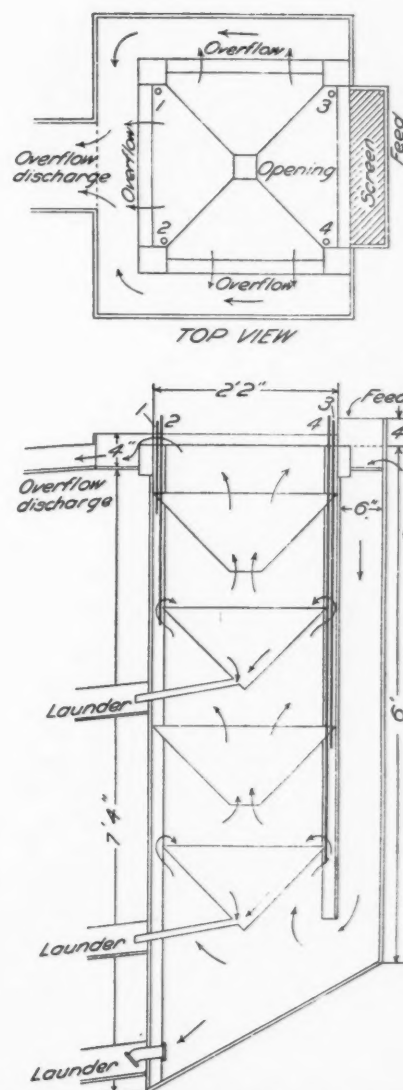


Fig. 15. Bird underfeed hydraulic classifier

### Wisconsin Likes Gravel Roads

**"WE HAVE FOUND** that the most satisfactory cheaply built roads to maintain are the gravel roads," writes A. R. Hirst, State Highway Engineer of Wisconsin, in the January issue of "Public Roads," the official bulletin of the U. S. Bureau of Public Roads. "We have scarified many miles of old gravel roads and at a cost of \$200 or less per mile have produced a surface very satisfactory and easy to maintain. The more experience we have with gravel the more convinced we are that it is the lowest cost surfaced road, both to build and maintain, and much superior to water-bound macadam. We believe that the particles of gravel in the top four inches of a gravel road should not be larger than one inch, and we would crush even finer if it were not so expensive to produce fine crushed gravels. Gravel roads give the best and smoothest service without surface treatments. If it is necessary to treat them to eliminate dust use very light oils and don't try to build up a protective coat."



# Record Prices for Alfalfa Hay

## Chance for the Eastern Agricultural Lime Producer to Emphasize Home-Grown Alfalfa

**H**EAVY SALES OF NEW-CROP ALFALFA hay are being made by Kansas City dealers to the extensive consuming territory surrounding Philadelphia, in the New England states and elsewhere in the East. Compared with the volume of new hay moving from the producing districts of Kansas, Oklahoma, Missouri, Nebraska, Colorado and New Mexico, dealers on the Kansas City market estimate the purchases by the eastern consuming interests as the largest on record for this period of the year. In many instances orders for good quality alfalfa from the Philadelphia territory remain unfilled owing to the scarcity of offerings of choice and No. 1 hay on this market.

The easterners who at present are supplying the broadest outlet for new-crop alfalfa hay, are paying near record prices for their forage requirements. Alfalfa is selling here around a top figure of \$32 a ton—the highest price on record for this period of the year and doubtless an unprecedented mark from a quality standpoint. Some weeks before the inauguration of the movement of new alfalfa hay to market sales were made in Kansas City at an extreme top of \$40 a ton. New-crop alfalfa hay sold on the Kansas City market a year ago at a top of \$20 a ton, with some sales as low as \$7.

### Damage Boosts Price

Trade interests here declare that buyers of the east, as well as other territories of the country, are paying \$5 to \$10 a ton more for alfalfa than the prices which would have prevailed now had the first cutting of alfalfa hay in the important producing area of the southwest not been seriously damaged. Farmers of this territory gathered the largest crop on record for the first cutting, but heavy rains, cool temperatures and generally unfavorable weather conditions damaged approximately 80 per cent of the harvest. Virtually no choice or No. 1 alfalfa hay has been received in Kansas City from Kansas and Oklahoma, the bulk of the offerings grading standard or lower. And it is not probable that more than an insignificant percentage of the first cutting will be received in choice condition from these two states. Much alfalfa was forced to remain in the fields two to three weeks after the cutting, and having been rained upon, lost its pea-green color.

Easterners as a rule demand the pea-green color, and some disappointment is manifest over the quality of hay moving to the New England territory. Small quantities of choice pea-green alfalfa have been shipped from the irrigated districts of New Mexico to apply on orders from

dealers in Philadelphia territory. The movement of New Mexico hay to Kansas City is light on the whole, being restricted by a freight rate of around \$10 a ton. Kansas City has never before drawn new crop alfalfa from New Mexico for direct shipment to this market, though it is common for dealers here to make purchases in the irrigated growing districts of that state for shipment in the south and southeast.

### Movement Is Delayed

Another factor serving to hold the market at a level of \$5 to \$10 a ton higher than would now be witnessed under normal conditions is the serious destruction of alfalfa fields by army worms in Kansas, Missouri, Oklahoma and elsewhere in the southwest. Advices from surrounding states indicate the tonnage of the second cutting of alfalfa will be hardly more than 50 per cent normal. The average tonnage of the second cutting is approximately one ton

per acre, compared with one and one-fourth tons as the average yield of the first cutting, so it is apparent that the market movement of new alfalfa will be further delayed. Also, the sharp premium being maintained on the choice grades over the poorer quality hay will prevail for some time yet.

New crop prairie also is moving to market, though in only light volume. Indicative of the extraordinary conditions in the forage trade is the fact that new prairie is selling at a top of \$40 a ton, \$8 to \$10 a ton above alfalfa, and more than double the prices on new wild hay at this time a year ago. Normally, alfalfa maintains a premium of \$10 to \$12 a ton above prairie, and fatteners of live stock also consider such a difference in actual feeding value. But there is an acute shortage of prairie. While little prairie moves to the east, the wild hay wields an important influence on the alfalfa market.

The foregoing data, taken from a recent issue of the Philadelphia "Public Ledger," certainly ought to be used to boom agricultural lime sales. Eastern soils with a plentiful use of lime will grow just as good alfalfa as the western prairies.

## F. A. Jones Leaves Kelley Island Company

**F.** A. JONES, manager of operations of the Kelley Island Lime & Transport Co., Cleveland, Ohio, for a number of years, has resigned, effective July 1, to accept the position of manager of the limestone department of the Columbia Chemical Co., with headquarters at Zanesville, Ohio.

The Columbia Chemical Co. is erecting a large stone plant at Zanesville, and ultimately will build a huge lime plant there. Mr. Jones will be the engineer in charge

of design and construction as well as of operation.

He has had a very extensive experience in the rock products industry, being engineer of the United States Gypsum Co. before his affiliation with the Kelley Island Co. He is a prominent member of the Lime Association and has been of great service to the Association in committee work.

## Lime Convention Greeted Returned Soldiers

**T**WO RETURNED officers of the American Expeditionary Force received a cordial welcome from their old-time associates in the lime industry at the recent Pittsburgh convention of the Lime Association. They were Maj. C. W. Hitchcock, of the Federal Lime & Stone Co., formerly New York City sales manager of the Woodville Lime Products Co., and Capt. Irving Warner, brother of Charles Warner, of the Charles Warner Co.

Both these lime men saw much active service in France and had many interesting experiences to relate.

## Prices Up in Two Months

**B**LOOMINGTON, Ill.—One man here who did not wait for a drop in the price of material is now congratulating himself for letting a contract for a new house, about eight weeks ago. Since then his contractor has informed him that he has figured four jobs of similar design and construction and had to charge \$1,000 more. Prices on materials have been advancing



F. A. Jones



# NEW MACHINERY EQUIPMENT



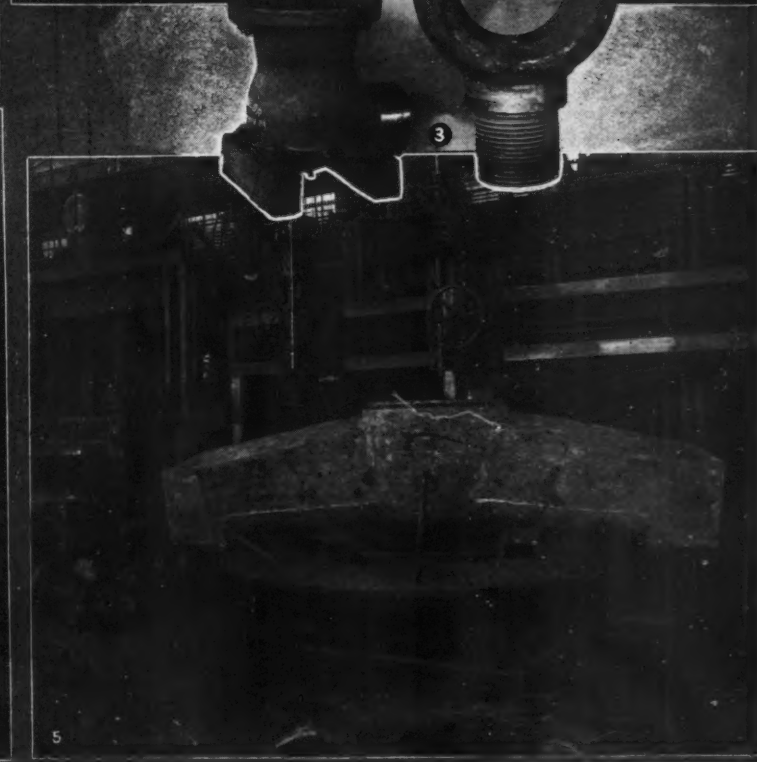
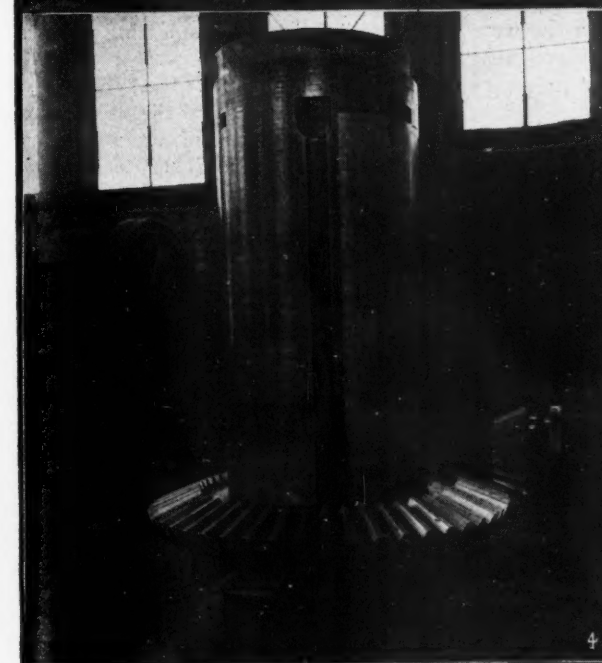
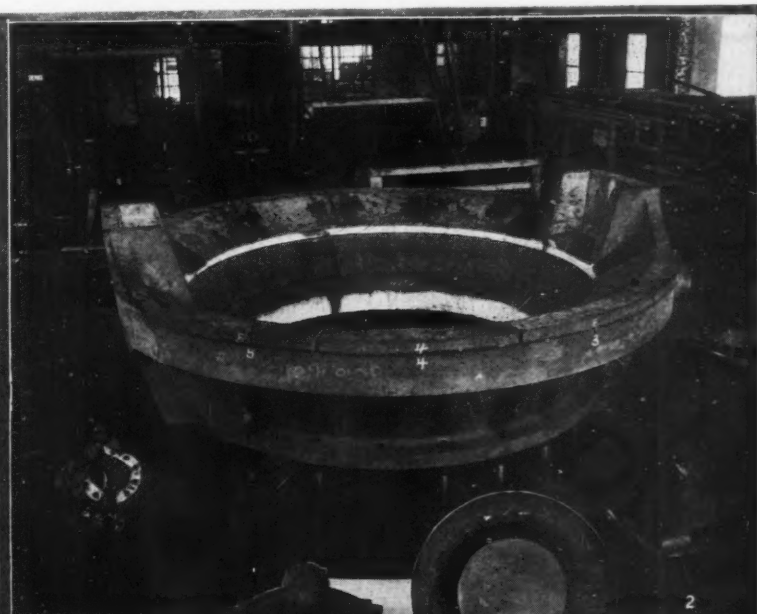
## A 60-In. Gyratory

THE ACCOMPANYING views show some of the details of the 60-in. gyratory crusher made by the Traylor Engineering & Manufacturing Co., Allentown,

Pa., which was described in ROCK PRODUCTS, of May 10.

The first view shows the contrast between the biggest and the littlest gyratory made. Views 2 and 3 show the top shell, which weighs 115,000 lbs. and the

spider, or yoke, which fits into it. The fourth view shows the eccentric. The babbitt for this eccentric was peened in place and then machined to insure perfect contact for the journals. The eccentric is 5x9 ft. and weighs 20,000 lbs.



(1) Assembled crusher; (2) Apron or ring at the top of the crusher shell; (3) Eye-bolt of big crusher and smallest crusher; (4) Eccentric; (5) Spider



# General News From the Rock Products Markets

## License System for Potash Imports and Later a Tariff Is Proposed

WASHINGTON, D. C.—The house committee on ways and means has started revising the tariff, and has completed a little preliminary work by holding hearings on the special tariff bills which have been introduced since March 4th.

The first bill taken up was that of Representative Fordney, chairman of the committee, to provide a special licensing system for potash imports, to be followed after five years by a heavy protective duty. Representative Fordney declared he believed this would permit the fullest possible development of our potash resources, without hampering the operations of those interests in this country which are among the chief consumers of the commodity.

The testimony of the various witnesses who appeared before the committee developed into an interesting story of the growth of this war industry, from the point where the United States, neglecting its own resources, was entirely dependent upon the potash industry of Germany, to a position where, today, it can satisfy 40 per cent of its needs out of domestic resources, with every prospect that, properly protected, future development will make us independent of the potash production of the outside world.

One of the chief witnesses before the committee was George O. Smith, of the geological survey, who told of the work which has been done in this line since 1911, when we first glimpsed the inside workings of the German potash trust. At that time, Congress authorized the government to begin a search for potash in the United States, and Mr. Smith told of the work of his bureau in investigating all possible sources of potash. Because of the special pressure of war needs, and the embargo on German potash, the domestic production had risen to 50,000 tons a year in 1918, about one-fifth of our total needs, but the productive capacity of existing plants is now approximately 100,000 tons a year.

The cessation of hostilities, he said, coupled with the expectation of imports from Germany, has brought the domestic prices down to a point where our own industry is working far below capacity, and unless protective methods are provided, it is but a matter of time before the industry becomes one of the "lost arts" of the country.

## Illinois Lets Contracts for 325 Miles of Roads—650 by August 1

UP TO JUNE 21 the state of Illinois had let upwards of 325 miles of roads, principally on the Lincoln and Dixie Highways, the Chicago-St. Louis Highway, and the National Old Trails; a number of state aid and county projects are also under contract.

It is the aim of the Highway Department to have some 650 miles of trunk line roads under contract before August 1, says the Illinois Sand and Gravel Producers' Association Bulletin.

As a further indication of public confidence in the present price level, numerous counties have authorized bond issues for roads and other public work, one of the large ones being \$500,000, passed by the Sangamon commissioners this month, and a great many cities and towns are going ahead with plans for the improvement of streets, sewer systems, water works, municipal light plants, etc. There will apparently be no limit to activity but the supply of labor available.

## Sand-Lime Brick Bulletin Tells a War Story

SAND-LIME BRICK played a big part in the war. Many millions of the brick were used in government and munitions buildings, according to the Bulletin issued by the Sand-Lime Brick Association. And it adds: "These were practically all substantial structures that will serve peace-time industry for years to come." The Bulletin is published in the interests of the manufacturers and is used, of course, for propaganda among possible builders of factories and other large structures.

Pictures of several of the great factories are shown, including the Curtis Aero and Motor Corporation in which about 2,000,000 sand-lime brick were used; U. S. Naval Ordnance plant at Dayton, O. (1,000,000 brick); Recording and Computing Machines Co., Dayton (several millions), and the Four Wheel Drive Auto Co., Clintonville, Wis. (5,000,000).

This is only a partial list, of course. The brick for these structures were furnished by the Acme Brick Co., Milwaukee; the Buffalo Sandstone Brick Co., Buffalo, N. Y., Crume Brick Co., Dayton, O., the Paragon Plaster Co., Syracuse, N. Y., and the Composite Sales Corporation, Rochester, N. Y.

## Grande Sand-Lime Brick Co. Enlarges Its Plant

GRAND RAPIDS, Mich.—The Grande Brick Co. has just completed a large addition to its plant for the purpose of hydrating lime, also storage bins for the material.

The capacity of the plant is 25,000 sand-lime brick in 24 hours. So great is the demand at present to fill orders the plant is run to its fullest capacity.

The Grande Brick Co., was organized in 1909, largely by Grand Rapids capitalists, and H. O. Joseph was made general manager, which position he holds today.

## Extensive National Highways System Outlined in Osborne Bill

WASHINGTON, D. C.—A new Government department, to be known as the Department of Federal Highways, is proposed in a bill introduced into Congress by Representative Osborne of California. It is designed to establish a national highways system, promote efficient and economical highway transportation and amend the state road aid act.

The proposed highway system provided in the measure is to consist of not less than three main trunk-line roads from the Atlantic to the Pacific, and not less than four main trunk-line roads from the northern boundary to the southern boundary of the United States. Also, including these roads, there are to be not less than two main trunk-line roads in each state, together with intersecting roads uniting and connecting the national highway system.

The secretary of Federal Highways, who will be the head of the new department and a member of the President's cabinet, is to receive \$15,000 per annum. Other secretaries receive \$10,000 a year.

The system is not to include any highway in a place having a population of 5,000 or more, except portions of such highway along which the houses average more than 200 feet apart. The types of construction and the character of improvement, repair and maintenance of all highways are to be determined by the secretary. Only such durable types and adequate widths of surface and foundation shall be adopted as will effectively meet the traffic conditions thereon and the probable future traffic needs.

For the purpose of carrying out the provisions of the bill, there are included appropriations of \$100,000,000, to be available immediately, and \$200,000,000 per annum for the eight following years, a total of \$1,700,000,000, all of which is to be available until expended.



# General News From the Rock Products Markets

## United States Bureau of Manufacturers Wanted by Senator Sheppard

WASHINGTON, D. C.—The establishment of a bureau of manufactures as an independent branch of the government, for the purpose of studying manufacturing in all its forms and working for the benefit of the industry of the country, is proposed in a resolution introduced in Congress by Senator Sheppard of Texas.

"The further development of manufacturing processes is one of the most important and powerful means of increasing the nation's efficiency, wealth, and prosperity," declared Mr. Sheppard. "Departments of the government are now devoted to agriculture, commerce and labor, but so far no department or bureau has been established for manufacture, the other fundamental source of national progress. The conversion of raw material into finished products should be effected as near the place of production as may be consistent with access to markets."

## Texas Building Material Concerns Overcrowded with Orders

DALLAS, Texas.—According to a report made by a committee of manufacturers of building materials in Dallas, there are at this time enough orders on hand by the different manufacturers and jobbers in the state to exhaust the supply for six months to come. The men who conducted this research were C. E. Ulrickson, E. G. Brower, W. A. Sedwick, C. W. Martin, J. H. Payne and E. S. Morgan. They found that builders were slow to start last spring, hoping for lower costs, and in the meantime the demand for buildings became greater and greater. Now that the building program is getting under way, orders are reaching the manufacturers more rapidly than they can fill them.

Great quantities of cement have been required in the oil well development of Texas and Oklahoma, and this, together with recent orders for buildings, have kept the output of the plants moving steadily. They have been unable to build up reserve stocks for good roads projects throughout the state.

The supply of freight cars has an important bearing upon the building situation, and it is predicted that, on account of the large size of the grain crop, the car shortage which Texas experiences every year will begin earlier and be more serious this year than ever before. It is apt to be felt in more or less degree from July to November.

## Ohio Gravel Men Helped Put Road Law Across

GUY C. BAKER, secretary of the Ohio Sand and Gravel Producers' Association, informs ROCK PRODUCTS that the statement made in the issue of June 21 in the brief note, "Macadam and Maintenance Wins Ohio," is most unfair to the other good roads interests of the state.

Mr. Baker states most emphatically that the Ohio highway bill "was passed because the Ohio Good Roads Federation, the various farmer organizations, and the brick, cement, and sand and gravel associations, as well as the Ohio Macadam Association, were back of it." He says further: "More than that, the object of the bill was not the maintenance of macadam roads. The object was the maintenance of all types of roads. It is true that there is probably no type that requires as much maintenance as macadam, but this fact does not change the purposes for which this bill was passed."

Not having a copy of the bill, ROCK PRODUCTS cannot attempt to pass judgment on its purpose, but it is pleased to learn that the bill is satisfactory to all parties, in any event.

## Switching Charges and New Bill of Lading Form

BEING AN OLD railroad man, Ben Stone, business director of the Illinois Sand and Gravel Producers' Association, possesses a special facility in keeping track of matters affecting shippers on railroads.

In his bulletin of this week, he notes that:

"Formerly, because of relatively low rates on these commodities, in a great many instances the carriers declined to absorb terminal switching charges. We have expressed the opinion that present rates are sufficiently remunerative to justify full absorption. During the past week voluntary applications have been made by several roads for permission to eliminate from their tariffs restrictions against absorption of switching, the principle arguments used being the same as mentioned above."

Regarding the bill of lading form, he advises:

"The Interstate Commerce Commission has postponed the effective date in its order on the bill of lading case from August 8 to September 8, 1919. The Commission has disapproved of any use of the present form of bill of lading on and after September 8. In other words, the new form must be used on and after that date unless made effective sooner by the carriers."

## Texas Factory Town to Be Built of Concrete

DALLAS, Texas—The Proctor-Gamble Co., of Cincinnati, has purchased 60 acres of land near Dallas, on which a manufacturing plant will be constructed, for about \$2,000,000. Homes for employes, storehouses and extensive shipping terminals will be of concrete construction.

## Would Build Military Road in California

WASHINGTON, D. C.—Under the terms of a measure just introduced in Congress by Representative Lea of California, \$1,500,000 is to be appropriated and used in the construction of a highway suitable for military coast defense purposes along the north Pacific coast of California, to be known as the Roosevelt Highway. This sum is to be used only if the state of California provides a similar amount for the building of the road.

## Concrete Warehouse for Texas Cotton to Cost \$2,000,000

DALLAS, Texas—The initial contract for erecting a cotton warehouse to cost \$2,000,000, has just been awarded by the Dallas Cotton Warehouse Co. The first unit will be a four-story reinforced concrete fireproof structure, 50x130 feet, with a storage capacity of 60,000 bales, and will cost \$700,000. With the other units added the total storage capacity will be about 400,000 bales.

## Should All U. S. Engineers Be in One Department?

WASHINGTON, D. C.—Important changes in the make-up of the government departments are included in bills now before both houses of Congress. These bills provide for the re-designation of the Department of the Interior as the Department of Public Works, in which will be assembled all the engineering activities of the government.

The various non-engineering bureaus of the Interior Department will be transferred to other departments. Thus the patent office will be placed under the Department of Commerce; the pension bureau under the Treasury Department.

On the other hand, the new department will include all the engineering bureaus of the other departments. If these bills are adopted, all military road building, all government construction and the government's investigations of building and other materials will be under the jurisdiction of the new department.

# General News From the Rock Products Markets

## Illinois Assembly Passes Numerous Road Bills

**B**ILLS AFFECTING road construction passed by the Illinois legislature, which concluded its labor this month, were quite numerous. Among the most important were: Provision for widening and relocating roads; use of special taxes for construction of brick or concrete roads; use of cement and bituminous concrete on State-Aid roads; authority for the state to purchase certain deposits of novaculite for road building purposes, and power to build or lease plants for the manufacture of road building materials.

For the last two named items, no special appropriations were made, and it is the understanding that the exercise of the power granted in these two measures will remain optional with the administration.

## U. S. to Spend \$6,000,000 for Army Warehouses in Texas

**F**ORT SAM HOUSTON, Texas—Colonel Daniel E. McCarthy, quartermaster of the Southern Military Department, with headquarters here, has received official advices from the War Department approving the construction of warehouses at Fort Sam Houston at an estimated cost of more than \$6,000,000. The contract for the buildings will be awarded about July 1.

Authority to erect warehouses needed at Camp Normoyle, San Antonio, has been given by the War Department also. Approximately \$150,000 will be expended. With the \$200,000 improvement project at Fort Sam Houston authorized, the Normoyle and Southern Department warehouse systems will bring the total construction program at San Antonio up to some \$6,350,000.

Construction of railroad tracks and switches needed about the Southern Department is specified in letters to contractors who have been asked to bid on the work.

It is estimated that the concrete buildings would cost between \$4,500,000 and \$5,000,000, while those of galvanized iron and concrete foundations could be built for something less than \$3,000,000.

The decision to build the warehouse plant here means that Fort Sam Houston will continue to be the biggest army center in the Southwest.

It will also mean the immediate outlay of several millions of dollars for material and labor during the next few months. Practically all the cement, lime, etc., needed for the buildings can be purchased in this territory.

## Rock Products Producers Are Interested in These Hearings

**W**ASHINGTON, D. C.—Although it was originally planned to begin the general tariff hearings in July, it is not now expected that they will be held before August, and possibly not until September. The pressure of other work—appropriation bills, League of Nations, railroads, etc.—and the vacation over Independence Day, will push these hearings back several weeks.

In addition to these outside influences, there are also a number of preliminary matters which must be taken up and disposed of before the general hearings can be held. One of these has already been disposed of in part—the hearings on the many special bills which have been introduced from time to time during the session, to protect certain industries, such as dyes, potash and glass.

Revision of the tariff is anything but a simple task, and the Congress that assumes this delicate work pursues it in a most circumspect manner. Both sides of the question demand to be heard, and, in tariff if not in other questions, both sides usually have good grounds for their contentions. In addition to listening to millions of words, poured out in a seemingly endless flood by hundreds of witnesses—business men, lawyers, scholars and self-elected "individuals representing the people of the country"—the victims on the ways and means committee have to assimilate figures showing imports, exports, production, wages, tariffs and what-not for anywhere from five to a hundred years back.

After the committee has done all this and has framed a bill which the House of Representatives adopts, the Senate does it all over again, and then they do it over for the second time in concert—this being known as conference—after which the bill, which bears absolutely no resemblance to the measure originally framed by the House committee, goes to the two houses for ratification, to the President for signature, and a new tariff is born.

## La Porte's Business Men Form House Building Corporation

**L**APORTE, Ind.—The Laporte Chamber of Commerce has voted to incorporate a house building incorporation and to take immediate steps for the building of 100 new houses in this city. Fifty will be built by the Chamber of Commerce, while individual initiative will be depended on for the construction of the other fifty.

## Fertilizer Manufacturers to Standardize Products

**N**EW LONDON, CONN.—W. D. Huntington, president of the National Association of Fertilizer Manufacturers, in an address at the convention here today, announced that within the last six months the industry had committed itself to the policy of manufacturing only high analysis grades of fertilizer, eliminating the so-called fractional grades, and that the result of this action "must ultimately be reflected in lower cost of food production."

Standardization of only the best, Mr. Huntington said, would materially reduce factory and selling costs, a saving in which the farmer and consumer were bound to share.

## Mileage Basis of Railway Rates Proposed

**T**HE FOLLOWING LETTER by Ben Stone, business director of the Illinois Sand & Gravel Producers' Association, to the members of his association tells its own story:

### Lobby at Work

A proposed amendment to the 4th section of the Interstate Commerce Law, known as the Poindexter bill, which would make the long and short haul clause mandatory and rigid, is now being considered by the senate committee on Interstate Commerce. There is a powerful lobby working for the passage of the bill, and we are informed that considerable sentiment in favor of it has already been created in congress and throughout certain parts of the country, particularly in the inter-mountain territory.

At its spring meeting in Milwaukee last week, the National Industrial Traffic League adopted a resolution opposing a rigid application of the long and short haul clause, and the Illinois District Traffic League has also gone on record against passage of the Poindexter bill.

It is true that members of this Association are not interested to a great extent in matters affecting interstate commerce, but under present conditions it would be impossible for anyone to anticipate the influence on state affairs of any national policy as regards transportation matters.

### Would Revolutionize Rate Fabric

The Poindexter bill, if passed, would revolutionize the rate fabric of the entire country. To the producer of sand and gravel it would mean the making of rates strictly on a distance basis, which I am sure you will agree would be a serious blow to the industry in a great many instances.

I would respectfully recommend and urge that each member of this Association either wire or write his representatives in congress that he is unalterably opposed to the Poindexter amendment to the 4th section of the act to regulate commerce.



# General News From the Rock Products Markets

## Sand and Gravel Business in Mississippi Valley

MEMPHIS, Tenn., June 25—The sand and gravel business is more active in June than it was in May, for the weather has made out-of-door operations more permissible. Construction work, after great delays, is beginning to open in the Mississippi Valley and especially in Memphis proper.

Highway construction under the inspiration of automobile travel and legislative enactment moves apace in several of the southern states.

The investment of eastern capital and the floating of large bond issues is promoting several big public works for the summer and autumn.

### Producers Busy

J. F. Dale Sand Co., at LaGrange, Tenn., are operating some large sand pits at that point and employ more than 100 persons steadily. The material is for railroad and general construction work.

The Missouri Portland Cement Co., Memphis, reports good summer activity in both sand and gravel. They are operating several boats in the Mississippi river and have several yards in Memphis. The company supplies railroads and the general building trade, in which there seems to be a distinct revival.

Louis Moss, of J. A. Denie and Son Co., 82 S. Front street, reports good building trade conditions in Memphis and Memphis territory as relating to the sand and gravel and cement trade. Actual start was delayed by the steady month of rain in May and much water the first ten days in June, but in residential, garage, warehouse and public structures work has at last begun. Mr. Moss has the honor to be one of the directing generals of the Chamber of Commerce membership growth.

Cahaba and Healy Construction Co., at Greenville, Miss., is doing a large amount of concrete road construction in that section under contract. They have camps at Shiftwater, Avon, Longwood, Glen Allen, and other points.

It is believed that by July 1, plans for the new city auditorium and market will be completed and that actual work will be begun some time this year.

The Loew vaudeville interests of New York have arranged for two big theaters. The larger one, which will have a seating capacity of more than 3,500, will be constructed of steel and concrete. The Palace Theater, a moving picture place, nearly as large, is to be on Union avenue. The automobile garage buildings, the Polk buildings, five in number, the steel and concrete warehouse of A. S. Barboro and Co., the Methodist Hospital work, in part, and several store-

## New Demurrage Rules Ordered

THE REDUCTION in demurrage noted in Rock Products, May 10, page 38, will become effective July 20. This time the announcement comes direct from the office of the Railroad Administration at Washington. The present charges for detaining cars are reduced to \$2 per day for the first four chargeable days and \$5 per day for each day thereafter, with separate average agreements on inbound and outbound cars.

house additions are now under way, all involving considerable concrete work.

Improvement work on six streets of Memphis has been ordered by the board of city commissioners of Memphis. Asphalt and tar macadam will be used in paving.

### More Army Trucks for Tennessee

For use of the State Highway department of Tennessee 92 army trucks have been allotted to Tennessee, in addition to those already obtained. These trucks will be apportioned to the various counties. This makes a total of 269 trucks that have been obtained from the department of agriculture.

### Arkansas Asks for Bids

Sealed bids are to be received by the commissioners of the Delta Road Improvement district of Lee County, Ark., at the office of the State Highway commission at Little Rock, Ark., July 7, for the construction of approximately 13.6 miles of gravel and concrete roads, concrete surface; 93,006 square yards. W. A. Elliott, chairman, Peters, Ark.; J. B. Hood, secretary, Gassett, Ark.; Carter and Knoch, engineers, A. O. U. W. Bldg., Little Rock.

## Japanese Cement

IN 1916 THERE were in Japan 20 companies manufacturing cement, employing an aggregate labor force of 6,444 persons, of whom 692 were females. The output of these companies increased from 4,772,579 barrels, valued at \$9,957,798 in 1916, to 5,398,918 barrels, valued at \$15,758,401 in 1917. Values of cement exported in 1916, 1917 and 1918 amounted to \$1,355,514, \$1,335,065, and \$2,996,065, respectively.

Most of the output is Portland cement made by the dry process. Some fine cement is being manufactured by the Aichi Cement Kakushiki, Knisha, Atsuta, Minamiku, Nagoya. Roman cement is also produced in several localities, but in very small quantities.

## Standard Portland Cement Corporation Sold to Santa Cruz Company

SAN FRANCISCO, Calif.—The Santa Cruz Portland Cement Co., has absorbed the Standard Portland Cement Corporation, also of this state, and is now engaged in buying in the stock of the Standard at a price said to be \$22.50. The purchases are being made through the Crocker National bank, and virtually all local shares have been sent in by the holders. A few eastern and European stockholders are still to be heard from. There were outstanding in the early part of June 38,369 shares. George T. Cameron is president of both corporations.

The transfer of the property of the Standard Company to the Santa Cruz will have been effected by the time of this publication. By the sale, the Santa Cruz Company becomes the owner of an additional manufacturing plant at Napa Junction with a capacity of 3,000 bbls. daily, and 100 acres of land. Its own plant at Davenport, Santa Cruz county, has a capacity of 6,000 bbls., and it owns there 1,000 acres of land. The transaction boomed the Santa Cruz stock, which rose to \$75 on the local exchange and few shares offered. June 18, the directors declared a dividend of \$1.25 a share.

## Asphalt Men Form National Association

REPRESENTATIVES OF THE principal asphalt producing companies of the United States and Canada have completed the organization of an association, the title of which is to be "The Asphalt Association." Its purpose will be to disseminate information along the uses of asphalt with particular reference to highways and street paving, co-operating with city, county and municipal officials and with scientific bodies and colleges seeking to bring about the most effective methods in the use of this well-known material. The officers elected for the ensuing year are as follows: President, J. R. Draney; vice-president, W. W. MacFarland; treasurer, N. G. M. Luykx.

The secretary, who will be the active officer in charge of the affairs of the association, is J. E. Pennybacker, former chief of management of the U. S. Bureau of Public Roads, and during the war period secretary of the U. S. Highway Council. The New York office will be located at No. 15 Maiden Lane. Other offices will be established soon at Chicago and Atlanta and ultimately in Canada and other cities in the United States. City and highway expenditures for this and next year are estimated at a billion dollars.



# The Rock Products Market

## Wholesale Prices of Crushed Stone

Prices given are per ton. F. O. B., at producing plant or nearest shipping point

### Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
<b>EASTERN:</b>						
Auburn and Syracuse, N. Y.....	.80	1.20	1.20	1.20	1.20	1.20
Buffalo, N. Y.....	1.25	2.00	1.85	1.65	1.45	1.25
Burlington, Vt.....	1.00	2.00	1.85	1.65	1.45	1.25
Coldwater, N. Y.....	1.00	2.00	1.85	1.65	1.45	1.25
Lime Kiln, Md.....	1.00	2.00	1.85	1.65	1.45	1.25
North Leroy and Akron, N. Y.....	1.00	2.00	1.85	1.65	1.45	1.25
<b>CENTRAL:</b>						
Alden, Ia.....	.40	1.00	1.00	1.00	1.00	1.00
Alton, Ill.....	1.85	1.45	1.35	1.35	1.35	1.35
Belvidere, Ill.....	1.25	1.25	1.25	1.25	1.25	1.25
Bettendorf, Ia.....	.90@1.00	1.00	1.00	1.00	1.00	1.00
Brilliant and Sherwood, Wis.....	1.40	1.30	1.30	1.20	1.20	1.20
Davenport, Ia.....	.65	1.05	1.05	1.05	.85	.85
Dundas, Ont.....	.80@1.00	.80	1.00	1.00	1.00	1.00
Eden and Knowles, Wis.....	(¼-in. 1.25)	1.00	1.00	1.00	.85	.85
Elmhurst, Ill.....	1.00	1.00	1.00	1.00	1.00	1.00
Grass, Mich.....	.90	1.10	1.00	.90	.90	.90
Greencastle, Ind.....	1.50	1.25	1.25	1.25	1.00	1.00
Illinois, Southern.....	.80@1.00	1.00	1.00	1.00	1.00	1.00
Lannon, Wis.....	1.00	1.00	1.00	1.00	1.00	1.00
Lewisburg, O.....	.80@1.00	1.00	1.00	1.00	1.00	1.00
Lima, O.....	.60	1.05	1.00	.91	1.00	1.00
Linwood, Ia.....	.75	1.00	1.00	1.00	1.00	1.00
Mankato, Minn.....	.90@1.10	1.50	.80@1.00	.70@.85	.70@.80	.70@.80
Mayville, Wis.....	.80@1.15	1.15	1.15	1.15	1.15	1.15
McCook, Ill.....	.80@1.15	1.15	1.15	1.15	1.15	1.15
Oshkosh, Wis.....	.80@1.15	1.15	1.15	1.15	1.15	1.15
River Rouge, Mich.....	.80@1.15	1.15	1.15	1.15	1.15	1.15
Sheboygan, Wis.....	.50	1.00	1.00	1.00	1.00	1.00
Stone City, Ia.....	1.55	1.95	1.95	1.95	1.75	1.75
Toronto, Can.....	1.55	1.95	1.95	1.95	1.75	1.75
<b>SOUTHERN:</b>						
Brooksville, Fla.....	1.00	1.80	1.85	1.75	1.65	1.65
Cartersville, Ga.....	1.00	1.20	1.40	1.60	1.40	1.40
Fort Springs, W. Va.....	1.10	1.20	1.40	1.60	1.40	1.40
Hopkinsville, Ky.....	1.10	1.20	1.40	1.60	1.40	1.40
Linnville Falls, N. C.....	1.10	1.20	1.40	1.60	1.40	1.40
<b>WESTERN:</b>						
Atchison, Kans.....	.50	1.80	1.80	1.80	1.70	1.70
Blue Springs and Wymore, Neb.....	1.55	1.45@1.50	1.45@1.50	1.35@1.40	1.30	1.30
Dittlinger, Tex.....	1.20	1.20	1.20	1.20	.90	.90
El Paso, Tex.....	.60	1.35	1.35	1.35	1.35	1.35
Kansas City, Mo.....	.60	1.35	1.35	1.35	1.35	1.35

### Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Bernardsville, N. J.—Trap.....	2.00	1.80	1.70	1.50	1.50	1.25
Birdsboro, Pa.—Trap.....	.80	1.25	1.25	1.10	1.00	1.00
Branford, Conn.—Trap.....	.50*	1.25	1.25	1.10	1.00	1.00
Castro Pt., Richm'd, Cal.—Trap.....	.50	1.25	1.25	1.10	1.00	1.00
Dresser Jct., Wis.....	.65@.75	1.40@1.50	1.25@1.35	1.10@1.15	1.10@1.15	1.00
Duluth, Minn.—Trap.....	.80	.95	.95	.90	1.40	1.40
Farmington, Conn.—Trap.....	1.00	1.40	1.70	1.55	1.40	1.40
Glen Mills, Pa.—Trap.....	1.80	1.80	1.80	1.60	1.40	1.40
Millington, N. J.—Trap.....	.75	1.20	1.15	1.10	1.00	1.00
New Britain, Conn.—Trap.....	1.00	1.35	1.70	1.55	1.35	1.35
Rock Hill, Pa.—Trap.....	.60	1.20	1.20	1.00	.90	.90
Westfield, Mass.—Trap.....	.60	1.20	1.20	1.00	.90	.90

### Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Atlanta, Ga.—Granite.....	1.60	2.85	2.35	2.35	2.35	2.35
Fair Oaks, Calif.—Cr. Bldrs.....	.85	1.05	.95	.85	.85	.85
Hendlers, Pa.—Quartzite.....	.80	1.00	1.25	1.00	1.00	1.00
Little Falls, N. Y.—Syenite.....	.80	1.20	1.40	1.20	1.20	1.20
Middlebrook, Mo.—Granite.....	3.50	1.75	1.75	1.75	1.00	1.00
So. Richmond, Va.—Granite.....	1.00@1.25	1.25@1.75	1.40@1.75	1.40@1.75	1.40@1.50	1.40@1.50
Stockbridge, Ga.—Granite.....	.75	2.00	1.75	1.75	1.75	1.75
White Haven, Pa.—Sandstone.....	.85	1.20	1.40	1.20	1.20	1.20

\*Cubic yard. †Agrl. lime. ‡R. R. ballast. §Flux. ¶Rip-rap. a 3-inch and less.

### Agricultural Limestone Wholesale at Plant, per Ton

<b>EASTERN:</b>	
Coldwater, near Rochester, N. Y.—Analysis: CaCo <sub>3</sub> , 56.77%; MgCo <sub>3</sub> , 41.74%—80% thru 100 mesh; ppr., 4.50; bulk.....	3.00
Hillsville, Pa.—Analysis, CaCo <sub>3</sub> , 85%; MgCo <sub>3</sub> , 1½%—(70% thru 100 mesh) in 80 lb. ppr. bags, 4.25; bulk.....	2.75
Jamesville, N. Y.—68% thru 100 mesh; 95% thru 50; 100% thru 20. Sacks, 3.75; bulk.....	2.25
Lime Kiln, Md.—50% thru 50 mesh; bulk.....	4.00
Pownal, Vt.—(50% thru 100) Analysis, CaCo <sub>3</sub> , 90%; MgCo <sub>3</sub> , 5%; ppr., \$4.50; bulk.....	2.75
West Stockbridge, Mass.—Analysis: CaCo <sub>3</sub> , 95 to 98½%—33% thru 200 mesh; 66% thru 100; 100% thru 40. Bulk.....	2.85
In cloth bags, 3.10. Bag charge, 10c, returnable.	
<b>CENTRAL:</b>	
Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, CaCo <sub>3</sub> , 96%; MgCo <sub>3</sub> , .75%.....	2.00
Bedford, Ind.—(90% thru 10 mesh) Analysis, CaCo <sub>3</sub> , 98.5%; MgCo <sub>3</sub> , 0.5%.....	1.75
Belleville, Ont.—90% thru 50 mesh.....	2.50
Canton, O.—100% thru 10 mesh; 40% thru 100; 59% thru 50.....	3.00
Columbia, Ill., near East St. Louis—(¾" down).....	1.25@1.80
Elmhurst, Ill.—(Analysis, CaCo <sub>3</sub> , 35.73%; MgCo <sub>3</sub> , 20.69%) 50% thru 50 mesh.....	1.25
Greencastle, Ind.—(Analysis, CaCo <sub>3</sub> , 98%) 50% thru 50 mesh.....	1.75
Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100.....	2.75@3.00
Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, CaCo <sub>3</sub> ; 44%, MgCo <sub>3</sub> .....	2.00
Marble Cliff, O.—(50% thru 100 mesh) Analysis, CaCo <sub>3</sub> , 86%; MgCo <sub>3</sub> , 8%.....	3.00
Marblehead, O.—(Analysis: CaCo <sub>3</sub> , 95.33%) 50% thru 100 mesh.....	3.00@4.50
McCook, Ill.—Analysis, CaCo <sub>3</sub> , 54.10%; MgCo <sub>3</sub> , 45.04%—100% thru ¼" sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 26.04% thru No. 50; 16.27% thru 100.....	.90@1.00
Milltown, Ind.—Analysis, CaCo <sub>3</sub> , 94%; MgCo <sub>3</sub> , 3%.....	1.50
Montrose, Ia.—(90% thru 100 mesh).....	1.25@1.35
Muskegon, Mich.—(90% thru 50 mesh) Analysis, CaCo <sub>3</sub> , 53.35%; MgCo <sub>3</sub> , 43.27%.....	2.50
Piqua, O.—Analysis: CaCo <sub>3</sub> , 32.8%; MgCo <sub>3</sub> , 3.2%; neutralizing power in terms of calcium carbonate, 95.3%—70% thru 100 mesh, bulk.....	2.50@4.00
Rockford, Ill.—Analysis, CaCo <sub>3</sub> , 53.75%; MgCo <sub>3</sub> , 44.35%.....	1.25
Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ¼" mesh) Analysis, CaCo <sub>3</sub> , 89.61 to 89.91%; MgCo <sub>3</sub> , 3.82%.....	1.50
Stone City, Ia.—(50% thru 100 mesh) Analysis, CaCo <sub>3</sub> , 98%.....	.50
Toledo, O.—Analysis, CaCo <sub>3</sub> , 52.72%; MgCo <sub>3</sub> , 43%—(20% thru 100 mesh; 30% thru 50; 80% thru 100; 100% thru 5/32 screen).....	1.80
Whitehill, Ill.—Analysis, CaCo <sub>3</sub> , 96.12%; MgCo <sub>3</sub> , 2.50%—50% thru 50 mesh, bulk.....	1.50
90% thru 100 mesh.....	5.00
<b>SOUTHERN:</b>	
Dittlinger, Tex.—Analysis, CaCo <sub>3</sub> , 99.09%; MgCo <sub>3</sub> , 40%.....	2.00
90% thru 100 mesh.....	1.00
90% thru 4 mesh.....	1.00

(Continued on next page.)

## Agricultural Limestone Wholesale at Plant, per Ton

(Continued from preceding page.)

Grovia, Ga.—Analysis, CaCO <sub>3</sub> , 95%; MgCO <sub>3</sub> , none—50% thru 100 mesh....	2.50
Hopkinsville, Ky.—Analysis, 94.6 to 98.1% CaCO <sub>3</sub> —Bulk .....	2.00
Memphis Jct., Ky.—(Analysis, CaCO <sub>3</sub> , 95.31%; MgCO <sub>3</sub> , 1.12%) average price .....	2.00
Ladd, Ga.—Analysis: 96 to 98% combined carbonates—All thru 10 mesh with all dust in .....	2.50
Mascot, Tenn.—Analysis, CaCO <sub>3</sub> , 52%; MgCO <sub>3</sub> , 38% .....	2.50
(80% thru 100 mesh) .....	3.50
(80% thru 200 mesh) .....	2.00
(All thru 10 mesh) .....	2.00
Paper bags, \$1.50 extra per ton; burlap, 2.00 extra per ton .....	
Tyrone, Ky.—Analysis, CaCO <sub>3</sub> , 90%; MgCO <sub>3</sub> , 5%—90% thru 4 mesh .....	1.50@1.75
Winnfield, La.—(50% thru 50 mesh) .....	4.50
<b>WESTERN:</b>	
Fresno, Calif.—(Analysis, CaCO <sub>3</sub> , 94%; MgCO <sub>3</sub> , .02%) 50% thru 200 mesh; 90% thru 100; 100% thru 40 .....	6.00
Prices for delivery: Sacks, 6.50; bulk Sacks, 10c each .....	
Kansas City, Mo.—(50% thru 50 mesh) .....	1.10

## Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

<b>GLASS SAND:</b>	
Bowmanstown, Pa.—Glass sand .....	2.50
Gray Summit, Mo.—Glass .....	2.00@2.50
Guion, Ark.—Glass on contracts .....	1.50
Hancock, Md.—Engine and glass .....	2.50@3.00
Klondike and Pacific, Mo.—Glass: Contracts .....	2.00
Carlots .....	2.50
Mapleton, Pa.—Glass, dry .....	2.50@2.75
Glass, damp .....	2.00@2.25
Massillon, Ohio—Glass .....	3.00
Michigan City, Ind.—Glass sand .....	.30
Millington, Ill.—Glass .....	1.75@2.00
Mineral Ridge, O.—Glass .....	2.75
Montoursville, Pa.—Glass, green, washed .....	2.00@2.75
Ottawa, Ill.—Glass .....	2.00
Large contracts .....	1.75
All others .....	2.00
Sands, Elk Co., Pa.—Glass sand: Selected, green .....	2.50
Thayer, W. Va.—Glass .....	2.75
<b>FOUNDRY SAND:</b>	
Albany, N. Y., District—Core .....	1.25@2.00
Furnace lining .....	2.25@2.50
Molding, fine and coarse .....	1.65@1.85
Sand blast sand .....	1.75@3.50
Brass molding .....	1.65@1.85
Allentown, Pa.—Core: molding fine .....	1.25@1.40
Arenzville, Ill.—Molding fine .....	1.50
Bowmanstown, Pa.—Core .....	1.25
Molding fine or coarse .....	1.50
Roofing sand .....	3.00
Cleveland, O.—Core, on car .....	1.00@1.25
Molding fine, on car .....	1.75@2.25
Molding coarse, on car .....	1.50@2.25
Brass molding, on car .....	1.25@2.00
Delaware, N. J.—Molding .....	1.50@2.00
Franklin, Pa.—Core, traction and brass molding .....	2.00
Molding, fine .....	2.00
Molding, coarse .....	1.50@1.75
Gray Summit, Klondike and Pacific, Mo.—Molding, stone sawing and traction sand, contract, 1.50; carlots .....	2.00
Greenville, Ill.—Molding coarse red .....	1.60
Hancock, Md.—Core and brass mldg. .....	1.65
Hellam, Pa.—Core .....	2.00
Joplin, Mo.—Stone sawing, flint .....	1.25
Kansas City, Mo.—Missouri River core .....	.75
Leesburg, Pa.—Core, furnace lining, molding fine and coarse, traction, brass molding .....	2.00
Mapleton, Pa.—Molding, fine and core, damp .....	2.50
Molding, fine, dry .....	3.00

(Continued on next page)

## Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

### Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
<b>EASTERN:</b>						
Attica, N. Y.	.60	.60	.60	.75	.75	.75
Buffalo, N. Y. (Niagara River)	.80	.80	.75	.75	.75	.75
Farmingdale, N. J.	.43	.43	1.75	1.35	1.35	1.35
Morristown, N. J.	.60	.60	1.20	1.00	1.00	1.00
Shaw's Land'g, Meadville, Pa.	1.00	1.00				1.00
Washington, D. C.—Wharves....	.75	.75	2.00	1.40	1.20	1.20
<b>CENTRAL:</b>						
Anson, Chippewa Co., Wis.	.50	.50	.95	.95	.85	.85
Barton, Wis.	.75	.75	1.00	.70	.70	.70
Beloit, Wis.	.50	.50	.60	.60	.60	.60
Chicago, Ill.	1.30@1.35*	1.25@1.30*	1.30@1.75*	1.25@1.30*	1.30*	1.25@1.30*
Chicago prices, F. O. B. cars initial railroad line. At pits in Chicago districts, .50@.65*						
Cincinnati & Miami Grove, O.	.60@.80	.55@.75	.55@.75	.55@.75	.55@.75	.55@.75
Columbus, O.	.65	.65	.60	.70	.70	.65
Des Moines, Ia.	50@1.00	.50	1.50	1.50	1.25	1.25
Drake, Mo.	.65	1.15	1/2, .90	.70	.65	.65
Earlestead, near Flint, Mich.	.55@.60	.55@.60	.85@.90	.70	.75@.80	.75@.80
Escanaba, Mich.	.90	.90	1.60	1.20	1.00	.90
Fort Dodge, Ia.	1.10	1.00	1.80	1.80	1.80	1.80
Fort Jefferson and Mechanicsburg, O.	.40@.60	.40@.60	.40@.60	.50@.70	.50@.70	.50@.70
Grand Rapids, Muskegon, and Holland, Mich.	.40@.50	.40@.50	.60@.70	.80@1.10	.70@.80	.70@.80
Hersey, Mich.	.50	.50	.70	1.00	1.00	.75
Illinois, Northern Points....	.60	.60@.70	.70	.70	.60@.70	.50@.60
Indianapolis, Ind.	.50	.50			.65	.65
Janesville, Wis.	.50	.50			.60	.60
(Wisconsin shipments)						
Lafayette, Terre Haute and Richmond, Ind.	.40@.60	.40@.60	.40@.60	.50@.70	.50@.70	.50@.70
Mason City, Ia.	.60	.50	1.45	1.35	1.30	1.25
<b>Railway ballast and road work, .40</b>						
1.20 for all sizes						
Milwaukee, Wis.	.40	.40	1.25	1.15	1.10	1.00
Minneapolis, Minn.	.60	.60	1.00	1.00	1.00	1.00
Moline, Ill.	.75	.75	.85	.75	.75	.75
Montezuma, Covington, Ind.	.55	.55	.90	.90	.80	.80
Oxford, Mich.	.95	.95	1.60	1.60	1.50	1.35
Saginaw, Mich.	1.35	1.20	1.50	1.30	1.25	1.25
St. Louis, Mo., F. O. B. cars.	.75	.75	.75	.75	.75	.75
Summit Grove, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.75	.75@.85	.75	.75	.75
Toledo, O.			.60 for all sizes			
Wabash Valley District, Ind.			All sizes, .75.			
Winona, Minn.		.70	1.60	1.10	1.10	1.10
<b>SOUTHERN:</b>						
Charleston, W. Va. (River)....		1.20	1.30	1.30	1.30	1.30
Dudley, Ky.	.90@.95	.90@.95	.90	.90		
Flomaton, Ala.	.85	.85	1.50	1.50		
Knoxville, Tenn.	.85	.85	1.35	1.35	1.35	1.10
Lake Weir, Fla.	.50	.50				
Macon, Ga.	.55	.55				
Pelzer, S. C.						
Roseland, La., and Condon, Miss.		.40		1.00		
New Martinsville, W. Va.	1.00@1.25	.60@.90	.80@1.00		.50@.80	
Thomas, La.	.60				1.75	
Waco, Texas	.67	.67	1.25	1.05	1.05	
<b>WESTERN:</b>						
Kansas City, Mo.	.60	.60				
Lincoln, Neb. (on cars) .....	1.00	1.00	2.10	2.10		1.90
Pueblo, Colo.	1.00*	.60*			1.50*	
Vancouver, B. C.		1.10*		1.30*		1.10*

### Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
<b>EASTERN:</b>						
Attica, N. Y.	.50	.50	.50	.65	.65	.65
Boonville, N. Y.	.65	.45@.65				.60
Farmingdale, N. J.	.50@.55	.50@.55	Road gravel, pit run, .53	.50@.60		
Pittsford, N. Y.	.50@.75	.50@.75				
Yardville, N. J.	1.00@1.10	1.00@1.10	(crushed rock sand)			
York, Pa.						
<b>CENTRAL:</b>						
Anson, Chippewa Co., Wis.		.60	.65, all sizes		.60	
Beloit, Wis.					.60	.60
Covington, Ind.						
Des Moines, Ia.			Washed concrete mix, 25% gravel, .70; 50% gravel, .90			.80
Drake, Mo.						
Escanaba, Mich.		.30	1.00 cu. yd., all sizes		.40@.50	.50
Gr'd Rapids, Muskegon, Mich.		.50				
Hersey, Mich.	.50	.50	Washed concrete mix, .55		.55	
Indianapolis, Ind.						
Janesville, Wis.						
Moline, Ill.	.80				.85	
Oxford, Mich.	1.00	1.00	1.30	1.20	1.20	1.20
Saginaw, Mich.			.50 for all sizes		.60	.60
Summit Grove, Ind.					.55@1.00	
Terre Haute, Montezuma, Ind.						
Toledo, Ohio			.60 for all sizes			
Wabash Valley District, Ind.			Pit run gravel under 2-in., .70			
Winona, Minn.						
<b>SOUTHERN:</b>						
Albany, Ga.	.60@1.00					
Howcott, La. (50% and up in rock content)	.75@1.10				.44	.65
Lindsay, Texas					.65@.85	.38@.48
Thomas, La.						
Waco, Texas						
Valde Rouge, La.			Sand Clay 50% metal on 1/4" screen, .60 per ton			
<b>WESTERN:</b>						
Pueblo, Colo.	.60		River Run, .60 unscreened			

\* Cubic yard. B Bank. L Lake. || Ballast.



## Crushed Slag Wholesale at Plant Per Ton

City or shipping point	Screenings, Roofing	¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
<b>EASTERN:</b>							
Bethlehem and Emaus, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Buffalo	1.75	.85	.85	.85	.85	.85	.85
E. Canaan, Conn.	3.00	1.25	1.50	1.15	1.10	1.10	1.10
Erie, Pa.	1.75	1.00	1.00	1.00	1.00	1.00	1.00
Emporium, Pa.	1.75	1.00	1.00	1.00	1.00	1.00	1.00
Ensley, Ala.	2.05	.90		.90@1.20	1.00	.90	.85
Hokendaugua and Topton, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Lebanon (Donaghmore), Pa.	2.50	.85	1.50	.85	.85	.85	.85
Philadelphia Dist.	2.50	.75	1.50	.85	.85	.85	.85
Pittsburgh Dist.	2.50	1.00	1.50	1.00	1.00	1.00	1.00
Sharpsville, Pa.	1.75	1.00	1.25	1.00	1.00	1.00	1.00
<b>WESTERN:</b>							
Chicago, Ill.			All sizes, \$1.50, F. O. B. Chicago				
Detroit, Mich.			All sizes, 1.65, F. O. B. Detroit				
Toledo, O.			All sizes, 2.00, F. O. B. Toledo				
Youngstown, Dover, Hubbard, Leetonia, and other Ohio points	1.75	1.00	1.25	1.00	1.00	1.00	1.00

## Agricultural Lime and Hydrate Wholesale at Plant per Ton

	— Agricultural Lime —		Per Cent	Per Cent	Agricultural
	Bulk	Bags	CaO	MgO	Hydrate
Bridgeport, Pa.	7.50		55	44	10.25
Chippewa, Lycoming Co., Pa.	5.00@5.50		78.67	1.33	
Hollidaysburg, Pa.	6.50		94.25	.30	
Manistique, Mich.		10.00	54 & 95	40 & 175	10.00
Newburgh, N. Y.			57	38	8.00

## Miscellaneous Sands per Ton Ground Rock Phosphate at Plant, per Ton

(Continued from preceding page)					
Massillon, O.—Steel molding coarse...	2.50	Centreville and Gordonsburg, Tenn.—			
Furnace lining	3.00	B. P. L., 60% to 72%; ton, 2240			
Millington, Ill.—Core, furnace lining, damp	1.50	lbs. Ground rock phosphate (90% thru 100 mesh)	6.00@8.00		
Furnace lining, dry	1.75	Lump rock, 72% to 75%, B. P. L.	6.00@8.50		
Roofing	1.75@2.00	Centreville, Tenn.—B. P. L., 60%	7.00		
Stone sawing	2.00	B. P. L., 70% and 78%	8.00		
Mineral Ridge, O.—Core, molding, sand blast, roofing, brass molding, etc., washed, screened	2.00	Centreville, Tenn.—B. P. L., 65% to 70%	7.00@10.00		
Montoursville, Pa.—Core, molding fine, traction	1.25@2.00	Jacksonville (Fla.) District—Soft phosphate	10.00@12.00		
Brass molding	1.25@2.00	(Add 2.50 for sacks)			
Michigan City, Ind.—Core, bank	.30@.40	Mt. Pleasant, Tenn.—(B. P. L., 70%)			
Ohio—Various points:		12%	6.00		
Iron molding, fine	1.50@2.25	13%	7.00		
Iron molding, coarse	1.75	14%	8.00		
Brass molding, minimum	2.00	Mt. Pleasant, Tenn.—B. P. L., 60% to 70%	6.00@8.00		
Ottawa, Ill.—Brass molding	2.00@2.50	Nichols, Fla.—Pebble—B. P. L. 67%	8.00@10.00		
Ottawa, Ill.—Core, Steel Molding	1.75@2.00	Phoslime, Fla.—Soft	14.00@17.50		
Sand blast	2.50	Walls, Tenn.—B. P. L., 70%	7.00@7.75		
Stone sawing	1.50@3.50				
Traction	1.75@2.00				
Ottawa, Ill.—Furnace lining, molding fine and coarse	1.50@2.00				
Ottawa, Ill.—Roofing	1.75@2.50				
Ottawa, Ill.—Sand blast sand	2.75@3.50				
Ottawa and Utica, Ill.—Furnace lin'g	.85@2.00				
Molding, selected	1.50@2.50				
Molding, coarse	1.75				
Thayers, Pa.—Core and traction	2.00				
Wedron, Ill.—Molding	75@1.00				
West Albany, N. Y.—Molding fine	1.75@2.25				
Molding coarse	1.25				
Brass molding	1.75				
Thayers, Pa.—Molding, fine	1.00@1.25				
Molding, coarse, furnace lining	1.00				
Zanesville, O.—Molding fine and coarse, brass molding	1.25				

## Prices Go Up as Volume of Construction Increases

NEW YORK—The upward price movement in building materials is keeping pace with the increase in volume of building construction, says the Dow Service Daily Building Reports, June 30.

Building is about 30 per cent under way in this city and about 50 per cent throughout the country. It is believed to have about reached its maximum for the present season. The question of building material supply appears to be increasingly

urgent as more and more manufacturers are refusing to take heavy forward orders.

## Prices Tend to Rise in Newark and East

NEWARK, N. J.—On June 1st, the price of Ohio hydrated finishing lime advanced \$1.00 a ton. The advance was not unexpected, inasmuch as the manufacturers predicted that such a move would be necessary when they dropped the price \$1.25 a ton in February. At that time the statement was made that the reduction was expected to

stimulate buying. It did help sales to a certain extent, but the volume looked for was not forthcoming at that time, say Tomkins Brothers of Newark, in their monthly review. At present, however, with greater interest being shown in building construction in general, sales of lime, both lump and hydrate, are gradually increasing.

Most material prices are firm, with greater probability of upward than of downward revisions.

## Cement Companies Loaded Up On Orders

NEW YORK—Building material price positions have just had their most crucial test and have, for the most part, survived, according to the Dow Service Daily Building Reports, June 23.

The test came in the form of a cynical circular issued by one of the purchasing bureaus of the U. S. Navy Department. It was addressed to the cement distributors of this city, announcing that it wanted bids on 10,000 bbls. of Portland cement and, in substance, demanded a lower price than the present market level. The attitude of most of the companies was exactly that indicated in this column earlier in the year, that the strong companies would sit back and let the price cutters load up on the unprofitable business if they want to accept it, and wait still longer, if necessary, for ordinary building orders that would at least insure sales of cement above a pauperizing profit level.

The cement market is too active to make price-cutting attractive, even for orders of this kind. Inquiries in one company in the first 14 days of June totalled 400,000 bbls. as against 250,000 in the whole month of June in 1918. Contracts signed by the same company in the 14 days of June of this year totalled 125,000 bbls., as against 30,000 bbls. in the whole month of June last year, 50,000 bbls. in all of June, 1917, 40,000 bbls. in all of June, 1916, and 10,000 bbls. in all of June, 1915. These figures are fairly representative of the movement in the Portland cement market in proportion to size of non-price cutting companies.

## Prospects and Prices in Macon

B. TAYLOR, manager of the Macon Fuel & Supply Co., Macon, Ga., producer of sand, writes:

"We have had more inquiries during the past 90 days than ever before. A tremendous amount of road paving is in view, elections having been held in a large number of counties for bonds for this purpose.

"The prospects for business in concrete and other road paving in this section are excellent. Prices are good."





## Incorporations

Keystone Gypsum Co., Wilmington, Del.; \$200,000.

Forrer Lime & Cement Co., Milwaukee, Wis., 1211 Humboldt Ave. Increase of stock from \$10,000 to \$25,000. Fred Forrer, president.

International Talc Company, Boston, Mass.; capital, \$500,000. To mine and quarry for talc, limestone, etc. E. P. Gage, P. S. Warren, M. Cole, all of Boston, Mass.

C. R. Griest, Mount Union, Pa., is organizing a company to manufacture concrete building blocks and other building material from the furnace slag dumped on a tract of land near Mount Union and purchased from O. J. Cassidy.

Manor Sand & Gravel Co., Wilmington, Del.; capital, \$50,000. To quarry and excavate for stone, rock, etc. M. L. Hotry, J. D. Frock, M. C. Kelly, local Wilmington, Del., incorporators.

J. R. Vinsant, Arthur Funk and G. A. Bosung of the Liberty Development Co., of Falls City, Ky., are reported to be considering the organization of a company to exploit a stone quarry and possibly a sand pit at Bowling Green, Ky.

Baehr-Buckhout Co., a foreign corporation. Wisconsin office, 425 E. Water St., Milwaukee, Wis. \$100,000 preferred; 2,000 shares no par value. Wisconsin share of stock, \$25,000. Purpose of corporation: Buying, selling, manufacturing and dealing in building materials and supplies.

The LaSalle (Ill.) Cement Co. has been incorporated. The company has a nominal capital stock—\$5,000, divided into 50 shares. Forty-eight of these shares, it is understood are held by Clarence Griggs, an Ottawa attorney, one by H. E. Spurgin, a young lady employed as Grigg's stenographer, and one by Lester J. Horan, Ottawa attorney.

C. E. Gilbert, at Aberdeen, So. Dak., has purchased the Culbert farm south of the town, obtaining 80 acres of sand and gravel, a house and a barn. This makes the third pit owned by Mr. Gilbert in the vicinity. His plans provide for loading cars by gravity for which purpose a switch track has been ordered. He contemplates a complete plant for digging, screening and loading.

The Torrance Lime and Fertilizer Co., of Torrance, Calif., has been formed to exploit a deposit of limestone in the San Pedro hills. The directors of the company are: President, George W. Thorne; Vice-President, W. W. Johnston; Secretary, Frank Sammons; G. W. Neill and Verne E. Johnston. The limestone appears to be of a marine formation, consisting of corals, shells, skeletons of carbonate of lime, calcareous sand forming a limy silt, vegetable matter, and microscopic animal life, which the percolating action of the sea water hardened into a dense, fine-grained limestone. An analysis shows that it contains 95 per cent of calcium carbonate, 1.25 per cent of magnesia, 3.72 per cent of phosphate, and .03 per cent of iron. The low percentage in iron makes it especially valuable for use in the manufacture of glass, while the low percentage in magnesia makes it valuable for use by sugar refineries. The deposit which was discovered only recently by W. W. and V. E. Johnston lies between Redondo Beach and San Pedro on the Western ranch. It covers 37 acres. Seven acres have been purchased and a long term lease has been obtained on the remaining. A road is being cut through the hills to Torrance so the product can be brought by truck.

## Cement

The St. Louis Material and Supply Co. has been awarded a contract for supplying the park department with 200 bbls. of cement at \$2.70.

The Coplay Cement Co. has offered the Borough of Coplay, Pa., all the cement, sand and stone necessary to pave every street in town.

The Missouri Portland Cement Co., of St. Louis, announces the election of J. Sheppard Smith, vice-president of the Mississippi Valley Trust Co., of St. Louis, to the board of directors of the company.

## Sand and Gravel

The Illinois senate voted 26 to 2 in favor of the administration bill providing that the state may erect or purchase and operate a plant for making cement.

The Gainesville Gravel Co., of Gainesville, Texas, of which J. F. Morris is president, operates two steam shovels at its pit at Lindsay, Texas, five miles west of Gainesville on the M. K. & T. Production capacity is 100 cars per day.

Waupaca Sand & Gravel Co., Waupaca, Wis. Amendment for the purpose of enlarging business as follows: "To operate sand and gravel pits, deal in sand, gravel, crushed stone and products manufactured from these materials, buy and sell building materials and supplies of all kinds; also deal in farm product, farm machinery, etc."

Judgment for \$12,500 was granted two weeks ago against Oscar M. Damm, J. L. Damm and George C. Bensinger, organizers of the American Mining and Milling Co., of St. Louis and Cairo, Ill., in favor of John Staines of Cairo. According to the testimony, Staines entered into an agreement with the American Mining and Milling Co., whereby the firm was to take a lease on property on which Staines knew there was a deposit of silica, and he in return was to receive one-fourth interest in the business. After successful mining operations, a controversy arose as to the ownership.

## Retail Dealers

Tomkins Brothers, Newark, N. J., opened their new branch office in the Pennsylvania Building, Philadelphia, June 1. This move was made necessary on account of the growing business in that territory.

The Detroit Builders' and Traders' Exchange have arranged an old fashioned picnic for the members and their families, to be held July 10 at Bob-Lo. The architects of the city will be special guests.

Huntington Architectural Stone Co., of Huntington, W. Va., to deal in building materials; capital stock, \$50,000. Incorporators: H. C. Hoffman, of Maysville, Ky.; V. D. Chandler, of Columbus, Ohio; E. S. Hyman, Hilda Froelich and Harry S. Irons, of Huntington.

The St. Louis Material Dealers' Association, whose membership includes most of the sand, lime and cement firms of St. Louis, has announced that the offices and yards of every firm in their membership will be closed July 4, 5 and 6 to give employees a three-day holiday.

The Pittsburgh Builders' Exchange held its annual outing at "The Pines," June 26, and it was an enjoyable family affair, with peanuts and lemonade free to all, races and prizes. The Material Dealers won the ball game from the Builders, 10 to 3. The Material Dealers have been doing this for three years now.

## Lime

The Big Four Lime Co., composed of the Lehigh Cement plant owners at Mitchell, has begun work on four new large lime kilns at the plant at Rabbittsville, says the Bedford (Ind.) Mail. These kilns are of the latest patent and when completed will make a total of 18 kilns in operation.

## OBITUARY

Philip M. Huckle, vice-president and general manager of the Ste. Genevieve Lime Co., of St. Louis, died at his home June 19, after a long illness. Mr. Huckle was 49 years old. He is survived by his wife. Mr. Huckle was born in Mascoutah, Ill., and was graduated from the University of Illinois. Later he returned to the university as professor of physics and chemistry. Mr. Huckle came to St. Louis in 1900, and later became connected with the Kolb Coal Co. At the time of his death he was general manager of the coal company, in addition to his position with the lime company. Mr. Huckle was very active in business circles, having been a member of the Chamber of Commerce and numerous other prominent organizations.

## Manufacturers

The Walter A. Zelnicker Supply Co., of St. Louis, has added 2,000 sq. ft. to its present office space at 325 Locust St., St. Louis, Mo., an increase of 33 1/3 per cent.

The Ball Engine Co., of Erie, Pa., builder of the Erie steam shovel, let a contract on June 18 for building an addition, 175 by 125 ft. to its shovel erecting shop. Other additions to the shovel plant are contemplated.

The Good Roads Machinery Co., for the first time in its history, will maintain a main selling office in Chicago, Ill., beginning July 1. This office will be in the Tower Bldg., Michigan Boulevard and Madison Street. Since this company was organized in 1898 it has maintained a large sales office at Fort Wayne, Ind. This office will be continued for the present, at least, on a small scale. D. L. Philips, former manager of the Boston office, will be in charge of the new Chicago office.

Austin Manufacturing Co., Chicago, in its new catalogue, No. 28, has supplied a text book on gyratory crushers and other quarry equipment for the man lacking engineering training. It is also one of the most complete catalogues of the kind. Diagrams, photographs and text help to an understanding of all parts of the machine. Other equipment shown in picture and text are elevators, screens, hoists, portable bins, dump cars, spouts and road machinery. A number of pages show plans from which plants have been constructed which are interesting and suggestive.

Stephens-Adamson Mfg. Co., Aurora, Ill., announces new representation in the San Francisco district. Bannon, Bodinson, MacIntyre, Inc., 317 Market Street, San Francisco, will have charge of the engineering sales work in this territory. The members of this firm and the technical staff are trained men with wide experience in designing, elevating, conveying and screening machinery. It was found advantageous to establish this new branch to give customers the same engineering sales services as in other territories.

## Quarries

The Somerset Stone Crushing Co. is rebuilding its plant at Bernardville, N. J., and installing some new machinery. W. A. McMurtry is superintending the work.

G. H. Davis, producer of limestone, of Blue Springs, Neb., writes that his greatest problem now is the matter of labor. Others have similar difficulty.

Louis Herzog, a horticulturalist of Neenah, Winnebago County, Wis., it is reported is going to prove that abandoned quarry holes can be of great use. He is converting several old quarry holes on his farm into fish hatcheries and is raising a different variety of trout in each of three different ponds.

The Boise Stone Co., of Boise, Idaho, has completed the shipments of stone from its quarry on Table Rock to New Haven, Conn., for use in the construction of dormitories for Yale university. This stone was selected some time ago by J. Gamble Rogers, a prominent eastern architect, in charge of the erection of the new buildings at Yale. He chose it from many submitted from different parts of the country, holding that it was of superior quality. The contract included several thousand cubic feet of stone of variegated colors.

## Slag

F. K. Sheesley, Johnston, Pa., purchased a complete slag-crushing plant of the Traylor Engineering & Manufacturing Co. The equipment includes: One 4 ft. x 12 ft. Sheridan shaking grizzly feeder, a set of 54 in. x 24 in. Traylor heavy duty crushing rolls equipped with corrugated shells, a set of 42 in. x 16 in. Traylor heavy duty crushing rolls with plain shells, a 60 in. x 24 ft. heavy duty revolving screen, a 48 in. x 12 ft. revolving trommel screen, a 36 in. elevator 37 ft. centers, a No. 8 elevator, 75 ft. centers. This plant will have a capacity of 1,500 tons crushed slag per day of ten hours.

# CLASSIFIED ADVERTISING

Rates for advertising in the Classified Department: 2.50 per column inch per insertion. Minimum charge, \$2.50. Please send check with your order. These ads must be paid in advance of insertion.

## Plants for Sale

FOR SALE—Half or whole interest in 18 acres best Agric. Lime Quarry; 20 ft. breast. Switch connections to L. N. R. R. Fully equipped for business. Demand for all product at good price, at quarry. Come and see. Frank Dittbenner, R. F. D. No. 3, Franklin, Ky.

## Steatite Deposit for Sale

Will sell, or lease on royalty, property containing valuable deposit of Steatite (Soapstone). Slate and Serpentine also present. Address

Box 1316 Care of Rock Products

## FOR SALE

50 to 75 acres practically solid limestone located at Stafford, N. Y., on New York Central; very little stripping; depth unknown; enormous quantity; analyzes from 95 to 99+% carbonate of lime.

J. F. KELLOGG  
Avon, N. Y.

## FOR SALE

A valuable Trap-Rock Quarry in Adams County, Penna. Crushing plant in good condition. An excellent opportunity and will be sold at a bargain. Address or apply to

J. L. WILLIAMS  
Gettysburg, Pa.

## FOR SALE

1/4, 1/3 or 1/2 interest in million tons of sand and gravel and equipment. For particulars write

Lock Box 26 Pearisburg, Va.

## FOR SALE

Crushed stone plant near Wymore and Blue Springs, Neb., on Union Pacific and C., B. & Q. railroads; the quarry farthest west in Nebraska or Kansas; 40 ft. of stone; light stripping; large territory; good prospects; 67 ft. of shale under quarry bed. Ideal location for fancy brick or Portland cement plant. Address

G. H. DAVIS, Blue Springs, Neb.

## Lime Plant For Sale

A working Lime Manufacturing Plant and Stone Crusher. Situated in Upper Merion, Montg. Co., Pa. For particulars address

W. P. DAVID ESTATE  
309 W. School Lane Germantown, Pa.

## Plants for Sale

### Great Future in Crushed Limestone

I have large bank of limestone on the M. & O. R. R.; 20 to 40 feet above the track level; 100 feet from track. Want to get in touch with parties who understand the business and would take interest. If interested write

P. O. Box No. 96 Cobden, Ill.

## LIME PLANT FOR SALE

Four Kiln plant in operation, making best quality lime, Central Ohio, with stone crushing and pulverizing equipment. Best of electric power. Abundance of Natural Gas for fuel. Large tract stone 40 to 60 foot face. Will help finance purchaser on best of terms.

Box 1319 Care of Rock Products

## FOR SALE

LIMESTONE PROPERTY consisting of 18 acres, estimated to yield an extensive tonnage of exceptionally high grade stone, suitable for agricultural use or in the production of chemical lime. Situation, vicinity of N. W. Mass., adjoins R. R. connecting with B. & M. System. Further particulars obtainable from

E. S. L., Box 132, Charlemont, Mass.

## FOR SALE

Limestone quarry, in Illinois, immense deposit, producing ballast, concrete stone and agricultural limestone. Good railroad connections and modern plant. Can offer very attractive proposition.

Box 1321 Care of Rock Products

## Situations Wanted

SUPERINTENDENT desires engagement with reputable company where ability and thorough knowledge of quarrying is recognized in the performance of efficient operation. References. Address Box 1310, care ROCK PRODUCTS.

## Location Wanted

### LOCATION WANTED

Where screenings are cheap and good market for the sale of glass and granite finish, concrete products such as monuments, markers, coping, vases, benches, sundials, bird-baths, etc.

E. G. KEMPER

2616 W. 111th St. Chicago, Ill.

## Help Wanted

### We Want Experienced Building Supply Man

Our lumber and building supply business has grown to such proportions that we need an experienced building supply man to take complete charge of that department. If you have some capital, so much the better. Liveliest city of 100,000 in middle west. Address

Box 1315, Care of Rock Products

## MEN WANTED

Superintendent, Master Mechanic and Chemist. Must all have had cement mill experience. Four thousand barrel plant, centrally located. State age, experience, references, salary. Confidential. Address

Box 1320 Care of Rock Products

## WANTED

Superintendent for gravel plant in Northern Indiana. Must understand steam and electrical machinery and be capable of keeping the plant in continuous operation. Good salary and bonus to the right man. Address

Box 1318 Care of Rock Products

## MAN WANTED

Desire to communicate with man experienced in lime burning and hydrating, both dolomite and high calcium. New plant in Rocky Mountain West. State experience and salary desired. Address

Box 1313 Care of Rock Products

## Will Represent Lime Mfrs.

Salesman, nearly fifteen years' experience with one of the leading distributors and manufacturers of lime in the east and splendid connections with the metropolitan trade, as well as that of Long Island and New Jersey, seeks connection with manufacturer of first class Ohio finishing hydrated lime. Correspondence with manufacturers of bbl. lime and common hydrated lime solicited also. Can furnish best of references.

C. G. BELING, 267 W. 126th St., New York City, N. Y.